EPA'S OFFICE OF RESEARCH AND DEVELOPMENT AND RELATED ISSUES

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THE EPA'S OFFICE OF RESEARCH AND DEVELOPMENT AND RELATED ISSUES

WEDNESDAY, MARCH 14, 1984

House of Representatives,
Committee on Science and Technology,
Washington, DC.

The committee met, pursuant to notice, at 9:30 a.m., in room 2318, Rayburn House Office Building, the Hon. Don Fuqua (chairman of the committee) presiding.

Present: Representatives Fuqua, George E. Brown, Jr., Scheuer, Glickman, Gore, Volkmer, Nelson, MacKay, Reid, Winn, Walker, Sensenbrenner, Gregg, Skeen, Schneider, Lowery, Chandler, Boehlert, McCandless, and Tom Lewis.

Staff present: George Kopp, Harold P. Hanson, David S. Jeffrey, Bob Palmer, Dave Clement, and Bill Harvey.

Mr. Fuqua. Good morning. Today's hearing will examine the Environmental Protection Agency's research and development programs and related issues.

In recent months, it has become very clear that the Agency has begun to address the Nation's health and environmental problems in an effective and responsible manner. On the other hand, there are still many issues that concern us. First is the adequacy of the research program and budget; and while the Agency's fiscal year 1985 request represents a significant increase over fiscal year 1984 and is a step in the right direction, the committee and the House felt that it was not adequate. The EPA authorization bill for fiscal year 1985, which recently passed the House by an overwhelming majority, increased the funding level by $19 million to a total of $298 million.

A second issue of concern is the adequacy of the scientific research program which, of course, is related to funding. The recent EDB issue, which is a problem not only in Florida but nationwide, illustrates that concern. We wish to know whether EPA has an adequate research program underway that will provide the answers on how to detect and prevent future EDB types of contamination before they become major problems. And while it's important to resolve those problems as they arise, it's even more important to take appropriate steps to prevent them from ever happening.

A related issue is the disposal of hazardous wastes. The number of superfund sites is increasing, as are the number of toxic waste dumps that are contaminating the environment. Again we ask, does EPA have a research program underway that is adequate to resolve the disposal and cleanup problems connected with toxic and hazardous wastes? What can be done to prevent future contamination problems?

The solutions to these and other issues facing our Nation are complex. The Agency and this committee must work toward resolving these problems, and we have been encouraged by the recent progress in the Agency and are looking forward to hearing about EPA's plans on how to resolve the health and environmental problems facing our Nation.

At this time I would like to recognize the gentleman from Kansas, the ranking minority member.

Mr. WINN. Thank you, Mr. Chairman.

I want to join the chairman in welcoming Mr. Ruckelshaus here today. It is a pleasure to have you as a witness, Bill, and I want to be among the first to commend you for the tremendous job that you are doing down at the Environmental Protection Agency. It's good to have you back on the job.

As you know, we on the Science Committee are especially interested in the activities of EPA's Office of Research and Development. Good research is absolutely critical if the Agency is to be able to set standards for the protection of the health of the American people. Quality research has not always been the case in EPA's first 10 years.

I was very pleased to see the Agency's commitment in this area demonstrated by a $33 million increase in the fiscal year 1985 budget request for research and development.

We are hearing reports of better organization, improved morale, and increased effectiveness at EPA. And, as I mentioned earlier, you are to be commended for the leadership you are providing the Agency. We look forward to hearing of future plans in your testimony, and I want to apologize to you in advance; there are 20-some-odd meetings going on on the Hill today alone, in the House committees, and I've got to be running back and forth, so don't think I'm not interested in the subject matter. Thank you.

Thank you, Mr. Chairman.

Mr. FUQUA. Thank you, Mr. Winn, and without objection, permission will be granted to take photographs, recordings, and other means of recording the hearing.

Mr. Ruckelshaus, we are very pleased to have you here today and you may proceed.

STATEMENT OF HON. WILLIAM D. RUCKELSHAUS, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY BERNARD GOLDSTEIN, ASSISTANT ADMINISTRATOR FOR RESEARCH AND DEVELOPMENT, ENVIRONMENTAL PROTECTION AGENCY

Mr. RUCKELSHAUS. Thank you very much, Mr. Chairman; Mr. Winn, I appreciate your kind comments.

In my view, as a preface to my statement, there are very few things that the Environmental Protection Agency does that are more important than our research and development. When I was at EPA and left some 10 years ago, one of the tasks that I felt was unfinished was integrating carefully our research and development effort into the rest of the Agency. The Administrator's attention tends to be focused on these emergencies of the minute, whether it's EDB or some other problem, and the soundness of the research program, the soundness of its management, the direction of that program aimed at the needs of the Agency, as well as the needs of the country, is something that will go unattended unless we pay attention to it very early on, unless an Administrator does that.

It was because of this that I launched a search for the Assistant Administrator for Research and Development when I first came back to EPA last May in an effort to find the best person that was around in the country to perform this essential management task for the Agency. I think in Dr. Goldstein, Bernie Goldstein, who is here with me today on my right, we found just such a person. I asked the opinion of scientists, people I've known for years in and out of the Government, all over the country for recommendations for this job, and one name kept turning up more than any other and that was Bernie Goldstein. I was particularly delighted when he was willing to take on this assignment, and I think we have in Dr. Goldstein somebody with a scientific background, the management background, the concern about health necessary to make this program work. And I am confident, with his assistance, that we can put the research program on a track that is essential for the Agency to discharge its responsibilities in the long and short term; and that is really what we're all about, and what we're attempting to accomplish. A strong, responsive research program must provide the information needed to make technically sound environmental policy decisions. While we've gained considerable knowledge in environmental sciences in recent years, much still remains to be resolved, particularly in areas related to hazardous and toxic chemicals.

My discussion today will focus on the goals shaping our 1985 research and development budget request. But first, I would like to say a few words about our strategic goals and the role of research and science in a regulatory agency such as EPA. Our strategic goals are still evolving; we're not there yet. But this budget of $278 million and 1,851 workyears brings us considerably closer. This represents increases of $33 million and 65 workyears over 1984. Some of the goals that we will be seeking to achieve are not reflected in the proposed 1985 budget. We are striving to strike the proper balance between shorter and longer term research. We need to integrate a better understanding and definition of problems with the research necessary for a sound scientific underpinning to all of our regulatory actions.

EPA's fundamental mission is to identify, assess, and reduce the risk of pollution to public health and the environment. Viewed in this context, the strategic mission of ORD's research program, in both the current fiscal year and over a longer timeframe, is to develop and advance the scientific and technical basis for risk assessment and risk management. The decisions we make, whether technological or health related, must have a sound scientific base.

We do know a lot about what we call conventional pollutants, such as, in air, carbon monoxide, sulfur dioxide, and ozone; and in water, biological oxygen demand, coliform, and chemical oxygen demand. These are the pollutants about which there is a good deal of scientific knowledge. We know with some certainty how these affect mature people. We have had some degree of success in controlling them.

We must now deal with a class of pollutants for which a safe level is difficult, if not impossible, to establish. These pollutants are associated with diseases we fear most—cancer and reproductive disorders, including birth defects. The scientific consensus is that any exposure, however small, to a genetically active substance embodies some risk of an effect. Since these substances are distributed throughout the environment, we must assume that life now takes place in the context of risks from hundreds, perhaps thousands, of substances.

Uncertainties abound when we try to assess the risk associated with a suspected carcinogen. These uncertainties appear in estimating exposure; in knowing whether a substance causing a carcinogenic response in animals also causes cancer in humans; in selecting the appropriate model to use in extrapolating cancer incidence from the high doses given to animals to the much lower doses typical in the environment; and finally, in the very mechanisms by which we suppose the effect to occur.

Given the necessity of acting in the face of such enormous scientific uncertainties, it is more important than ever that our scientific analyses be rigorous and the quality of our data be high. We must do all possible not to mislead people regarding the risks to their health. We can help avoid confusion both by the quality of our science and by the clarity of our language in explaining the hazards.

The research program at EPA has the critical and challenging charge to reduce these uncertainties. It is a task for which we cannot simply put up the money and say, "Solve it." It is one which requires continued attention and the making of difficult decisions on competing priorities.

It is with this in mind that we have developed our research program for 1985. We are focusing additional attention on identifying the scientific uncertainties which are crucial to the mission of EPA. Good scientific studies start by asking the right questions. For EPA, certain of the questions need to be answered in the near future; others will take longer because of the paucity of information currently available and because those issues might be better identified as emerging environmental problems. Our proposed budget reflects increased strength and quality in health and risk-related research as well as in those areas that future generations will look to as the tools and solutions required to manage those risks.

I would like now to summarize just a few areas of our research program which relate to our two primary goals: To improve our ability to perform risk assessments, and then to use them to guide our management of the environment.

Despite advances in environmental health information and the widespread use of risk assessments in regulatory decisionmaking, our ability to perform risk assessments is still hampered by the major uncertainties I spoke of earlier. As a result, health and risk assessment research is being increased by $4.8 million in 1985 to $65.5 million to improve the scientific basis for estimating the human health consequences of environmental pollution. Increases in epidemiology and extrapolation models will strengthen our estimates of human risk. We are also working very closely with other Federal agencies, such as the National Cancer Institute, NIOSH, and NIEHS, that are conducting epidemiological research. We will be assisting them in the design of studies, the actual field work, and the analysis of data. Our expertise and experience in environmental measurement can improve the exposure component of their studies, thereby making the studies more responsive to EPA's needs.

Also, we ask panels of peer reviewers periodically to review all of our research programs and give us recommendations on proposed areas of research to help ensure that the final research product will be scientifically credible and useful to the Agency in its decisionmaking process. In one review by NAS, we have requested advice on whether epidemiologic studies can be conducted to obtain data on the health effects associated with chronic exposure to the criteria air pollutants.

Our new integrated cancer assessment program will generate data on the relationship of air pollution to human cancer. This program will include the development of bioassays to determine the mutagenic potency of air emissions and the monitoring of human exposures to possible carcinogens found in the air. This integrated program also will determine the character and quantity of hazardous emissions from industrial sources and describe the atmospheric processes which lead to the formation of bioactive products in ambient air.

In the risk assessment area, we have embarked on a new program for updating and expanding our existing risk assessment guidelines for cancer assessment. We are also developing new categories of guidelines to cover health effects end-points other than cancer. Included here will be mutagenicity, teratogenicity, male and female infertility, and other systemic effects such as damage to the kidneys, liver, and other organs sensitive to environmental toxics. These initiatives are being taken pursuant to recommendations made by the internal Toxics Integration Task Force, and will significantly strengthen the scientific basis for regulations on toxic chemicals.

In addition, we are investigating the possibility of coordinating our risk assessment guidelines with those of other major regulatory agencies—FDA, Consumer Products Safety Commission, OSHA, and the Department of Agriculture. We hope to start with cancer guidelines, and might eventually develop interagency guidance for the other topics on which we are writing internal guidance.

It has become increasingly clear that the control and management of toxic and hazardous chemicals represent the most potentially serious health and environmental problem confronting this country today. These chemicals are pervasive, spreading throughout our air, surface and ground waters, land, food, consumer products, and workplace. I have already touched on what we will do to improve our knowledge of the health effects of these substances. However, substantial research is still required to develop methods and technologies to control and manage toxic and hazardous chemicals.

EPA's Office of Research and Development will play a key leadership role in developing the tools and knowledge to equip us to deal effectively and responsibly with these compounds. For example, in fiscal year 1985 we plan to improve methods to identify and quantify organic chemicals that are used in the dye industry. New and better methods for measuring the presence of hazardous pollutants in ambient air will also be developed. We want to develop and standardize tests that can be used for determining whether wastes should be classified as hazardous and subject to RCRA controls. Similarly, our research will provide us with the best and latest ways to measure total dioxins and selected isomers. Across all media program areas concerned with hazardous and toxic chemicals I am requesting over $104 million. Therefore, an increase of over $12 million from 1984 is targeted for this high priority work.

Over the past several years, several levels of conventional pollutants have been reduced markedly. As I have already discussed, more demanding and complex environmental problems still exist that require control technology solutions. Specific areas include managing the disposal of hazardous wastes, cleaning up uncontrolled waste sites, determining the release rates of new chemicals entering the marketplace, evaluating solutions to the problems of acid rain and hazardous air pollutants, and evaluating methods to properly operate and maintain municipal wastewater treatment plants.

The major emphasis in the engineering research support to RCRA is on developing alternatives to land disposal of wastes. This effort includes research on incineration, as well as evaluations of less conventional thermal treatment and destruction technologies. Some of the more innovative technologies we plan to evaluate include chemical detoxification processes and the use of genetically engineered organisms to detoxify wastes.

In support of Superfund, engineering activities will concentrate on two areas—evaluating technologies for managing sites and providing technical assistance to the enforcement and regional programs. Technology evaluation efforts are being expanded to accommodate accelerated Superfund activities and will include evaluations of prototypical technologies such as slurry walls, the mobile incineration system, the mobile soils washing system and the mobile carbon regeneration system. Fixation of contaminated soils will be demonstrated. In addition, a new joint Superfund/ORD team will be formed to review removal and remedial action plans, provide expert witnesses, and review consent decrees.

An increase of $5.4 million, to $58.5 million, is planned for the engineering research program, to focus on problem areas across all media.

Since environmental decisions can only be as good as the data that support them, it is essential that all environmental data generated by EPA meet high standards of accuracy and reliability. I have charged the Office of Research and Development with the responsibility of establishing and overseeing the implementation of an Agencywide quality assurance policy. To do this, ORD is in the process of working with all the EPA offices in helping them determine the quality of data they need in order to carry out their responsibilities. ORD is providing guidance on the performance of analytical methods and methods for determining precision and accuracy of measurements. Beginning this year, ORD will carry out a series of audits that will be used to evaluate progress by the various offices in implementing quality assurance. The audits will cover all of the major components of a quality assurance system from performance evaluation audits on actual samples to audits of technical and managerial systems.

As well as providing central management support for Agency-wide quality assurance, ORD will provide increased program-related support in the areas of pesticides, toxics, and Superfund.

Acid deposition is one of today's most important and controversial environmental problems, with regional, national and international implications. Expanded research is planned to provide accurate and reliable scientific information upon which decisions for action can be based. Strong scientific evidence is particularly critical in view of the major economic implications associated with various control strategies.

I am requesting funding of $34.4 million to address this critical problem, an increase of $19 million over 1984. Additionally, I have requested a supplemental 1984 appropriation of $5.5 million that will enable us to initiate a nationwide survey of lake chemistry.

In 1985, particular emphasis will be placed on completing the lake chemistry survey and initiating a national survey of forests. The goal of these surveys is to establish baseline information on the current status of the Nation's aquatic and terrestrial resources and to determine their sensitivity to acid deposition.

The number of wet deposition monitoring sites will expand under the National Trends Network. Originally, the network was to have had approximately 150 sites established by the end of 1985. With additional research funding, the network will be expanded by 40 to 50 additional sites within the same time period. The expanded number of stations will provide the deposition data required at the long-term lake and ecological monitoring sites.

At this time we have no measured data on dry deposition. Our research plan calls for the establishment of a number of pilot dry deposition monitoring sites. These sites will be part of an accelerated effort to develop and validate dry deposition monitoring techniques, and they will provide the first data on dry deposition in 1985.

This same expansion of the National Trends Network will give us better information on the trends in pH of rainfall across the country.

With respect to sulfate and nitrate concentration in receptors, our current plans call for the establishment of 40 to 50 long-term environmental effects monitoring sites. These will include both lake survey and additional sites for terrestrial, soil, and surface water effects. To date we have been limited by data on sites which scientists have chosen because they were experimentally interesting and looked like good candidates to show effects due to acid deposition. With the lake and terrestrial survey data, we will know much more about effects in a statistically balanced cross-section of sites.

This new group of effects sites will be coordinated with the augmented National Trends Network wet deposition system. These data will provide extensive information at the ecosystem process level on trends in chemistry and effects. These sites will be established in 1985 and will be designed to provide an early warning of any dramatic environmental changes that might occur.

To attempt to help resolve important questions regarding sources and receptors, we plan to conduct field studies to try to relate pollutant sources to acidic deposition. Studies now underway should help us understand the processes that govern the formation of acidic pollutants in the atmosphere, and their transport and deposition in sensitive areas.

We are also planning a large-scale atmospheric investigation to obtain empirical data on source/receptor relationships. As part of this research, a major experiment has just been completed in which inert tracers were released in the Midwest and Canada and then tracked in air masses moving across the Northeastern United States and Southeastern Canada. Initial findings of this study will be available later this year.

In order to learn more about possible terrestrial effects, we are planning extensive long-term studies to determine whether acid rain has caused damage or changes in the rate of growth and species composition in forests. Detailed planning for the forest survey began in 1983 and it should be available for implementation in about a year.

Additionally, the program calls for extensive new research to examine problems of nutrient leaching, metal mobilization, soil chemistry, and the psysiology and pathology of trees.

In summary, we are still dealing with large-scale uncertainties at many steps along the way from pollution source, through atmospheric transport, to effects on receptors, and finally to policy analysis on the best regulatory steps to take.

While the research just discussed represents the key growth areas, there are several research areas of importance that will remain as major areas of focus through 1985. These include ground water, sludge, LIMB [limestone injection multistage burner] and exploratory research.

The ground water research program at EPA is directed toward providing methods for assessing and monitoring ground water contamination. The program will also develop information needed for determining the movement and transformation of contaminants in the subsurface, and the cost effectiveness of aquifer reclamation. In short, the program will provide technical information to support the decisions involved in implementing the EPA ground water protection strategy, currently nearing completion.

We will continue our research to find more effective sludge management techniques. New approaches to wastewater treatment plant design will be evaluated with an eye toward reducing the volume and toxicity of sludge generated. Under this program we will develop guidelines for assessing the risks associated with contaminants in sludge, assess potential mutagenic and carcinogenic effects of organic chemicals found in sludge, and develop techniques for assessing the effects of ocean disposal of sludge.

We plan to continue our development of the LIMB technology for controlling emissions of sulfur and nitrogen oxides. LIMB, as a retrofit technology, shows promise for achieving a 50 to 60 percent reduction in sulfur oxide and nitrogen oxide emissions from uncontrolled powerplants at from one-fifth to one-third of the cost of conventional flue gas desulfurization, or scrubbing. A major component of our 1985 LIMB program will be to complete the funding of the accelerated research, demonstration, and testing program of the LIMB technology as it can be applied to wall-fired boilers. The demonstration and testing program will be cofunded with industry, and we expect to complete testing by 1988.

One important way in which EPA addresses future and emerging environmental issues is through its exploratory research program. This program has two major components: exploratory research grants and research centers.

The grants program solicits proposals, primarily from the academic sector, to conduct long-term research that meets the EPA's long-range research needs. The proposals are evaluated by external peer review panels for scientific merit and for relevance to EPA's mission.

We plan to continue operations at our eight university-based research centers. Each center is concerned with a specific, critical research area—for example, hazardous waste, control technology, ground water research, or epidemiology. In 1985, we will conduct a comprehensive survey of four centers which will have completed 5 years of operation. The review will evaluate overall performance of the centers and the appropriateness of their respective research.

I might add that there is a considerable amount of research, which might be called long term, that goes on within our media-oriented, or base program. Examples are atmospheric modeling, epidemiology, biotechnology, exposure monitoring and assessment, combustion modification, and advanced techniques for hazardous waste disposal. We have made every effort to prepare a research portfolio that contains a proper balance of long-term study with shorter term response and technical assistance. We estimate that over 20 percent of our total research funds is devoted to long-term projects. I think that within the bounds of our regulatory mission, our level of support for long-range environmental research is appropriate.

I hope my remarks have provided a broad look at the major goals and issues that we are trying to address in our fiscal year 1985 research and development program, Mr. Chairman. I would be glad to try to respond to any questions you might have.

Mr. FUQUA. Thank you very much, Mr. Ruckelshaus, and let me first of all commend you for a very, very fine statement and I think outlining some very important issues that we're all very concerned about.

In February you announced—and I didn't mention it in my opening remarks—the emergency suspension of EDB and recommended certain residue levels for grain and grain-related products and so forth. Are you developing a scientific base that will probably ultimately eliminate the use of EDB?

Mr. RUCKELSHAUS. The regulatory program that we've put in place, Mr. Chairman, will essentially eliminate the use of EDB as it has currently been used, either as a grain fumigant, a soil fumigant, or a fumigant for certain fruits like citrus. And the citric use is, for all intents and purposes, domestically ceased now in this country; it will be controlled for imports and then cease in September. And with the grain uses coming down very rapidly as a result of the actions taken, both last September and in February, while it may take as long as 3 to 5 years to finally get all of the stored grain that has been fumigated with EDB out of the system, that will be diminishing now very rapidly, and it will be hard to detect, I would predict, within a few months.

Mr. FUQUA. Well, are you doing any work on alternatives to EDB, such as radiation or something that would be more environmentally compatible?

Mr. RUCKELSHAUS. We have not done work ourselves. We've registered pesticides that are suggested as alternatives for EDB. The Food and Drug Administration has recently authorized the exploratory use of irradiation as a means of controlling fruit flies, in particular as a substitute for EDB. We have worked with the citrus exporters on cold treatment to determine whether that is available and, in fact, we are convening a conference—I think it's next month—of the users of EDB to explore the potential for substitutes. We do not have a research program for the development of substitutes for EDB's or specifically aimed at pesticides of that kind, but we do have a lot of exploratory research on the health effects of that, obviously.

Mr. FUQUA. You mentioned in your prepared statement about a program you are initiating on lake chemistry, and my question is, there are about 30 States that are affected, including my own State of Florida, with aquatic weed control. Many times the control of those weeds are by herbicides or some type of chemical-based control products, but EPA has had a program of aquatic weed control, primarily at the urging of this committee, to try to develop alternative methods to that. I noticed in the fiscal year 1985 request there is not any funding for aquatic weed research and I'm wondering if this is the end of the program? The Agency, Mr. Ruckelshaus, long before you came there, had never been enthusiastic about this, had been much less than enthusiastic, but we have felt that it was very important. And I'm wondering if, in part of your lake chemistry program, where you're looking at acidic deposition, that you might also broaden that to include certain other types of aquatic weed problems that confront and also interfere with the quality of pure water, and also with the fish and other marine life?

Mr. RUCKELSHAUS. Mr. Chairman, I'm aware of your interest in this program and the concern, particularly, of the people of the State of Florida with the effect of the aquatic weed——

Mr. FUQUA. There are 29 other States which have that problem—California, Oklahoma, most all the Sun Belt States have some sort of aquatic weed problem, so it's just not that we have it very acutely in my State—it's not just a Florida problem.

Mr. RUCKELSHAUS. The reason we haven't requested funds for this this year is we have completed a series of studies; I think we've spent something like $2 million over the last 4 or 5 years, and it really has been at the request of this committee that we've done that, on aquatic weed research, and have developed as a result of that, several assessments of the problem of aquatic weeds and recommendations for their control. I guess it's the sense of our scientists that at least that portion of the research is over. I'm sure that we could respond more fully to the committee as to exactly what our rationale is for believing that——

Mr. **Fuqua**. Well, maybe you could provide that for the record.

Mr. **Ruckelshaus**. Yes, we'd be glad to do that, and I might mention in terms of the acid rain chemistry, lake chemistry program, that really is aimed at the acid rain problem to try to determine how widespread it is. Our data base on acid rain is just appallingly thin, and we badly need to establish a baseline to understand what the situation is now in order to understand what's happening in the future. And that's the purpose of that lake chemistry program, and it might be difficult to integrate that into the aquatic weed program, as well.

[Material referred to follows:]

Reasons for not intergrating aquatic weed research with the National Lake Survey:

a. The current resources allocated are only sufficient to meet the objectives of the National Lake Survey, i.e. both intra- and extramural resources are limited.

b. The window for the Lake Survey is too short to be appropriate to perform any other tasks at this stage.

c. There already exist exceptionally good data on the aquatic weed problem, for example with the State of Florida.

The Lake Survey study focuses on sensitive regions where high elevation lakes are believed to be damaged. This may not be comparable with aquatic weed studies which investigate other pollutant effects besides acid deposition.

Mr. **Fuqua**. Well, you might be able to examine the impact that certain herbicides are having on lake quality in addition to acidic deposition.

Mr. **Ruckelshaus**. Yes, we could. The more parameters we examine, of course, the more complicated the program gets. There are a lot of things, in fact, that we could look for in a lake survey of this kind and it is somewhat a question of the time-related nature of the survey. We're going to survey something like 3,000 lakes across the entire country and the question of whether we should survey the surrounding soils as well to understand what might be happening in that lake, particular watershed, is a very open and heavily debated question now within the Agency. But we can certainly look into the possibility of expanding the program and see if that's possible.

Mr. **Fuqua**. Well, I'm interested in what happens because I know we fund things like nuclear physics and other programs and it seems to be an endless tunnel, because they keep finding new things, and I can't believe that the Agency has found out all that it needs to know about aquatic weeds. I would like to have that information if the Agency has concluded that study, if that was the case.

Mr. **Ruckelshaus**. We'll certainly provide that to the committee.

Mr. **Fuqua**. I think your head of your Office of Research is a better scientist than that, and I intend that as a compliment.

In the fiscal year 85 budget justifications, you have a Temik study in Florida for underground water, that's supposed to be completed in this calendar year. Are there any preliminary conclusions available from the study against the potential threat that it has for ground water and human health?

Mr. **Ruckelshaus**. The information that I have, Mr. Chairman, is that the University of Florida, which has been conducting this study for us is expected to submit a preliminary report by January 1985; that's the deadline that we've given them to submit the report. I don't know whether we have found anything out as of this moment or not.

Mr. **Fuqua**. Mr. Brown?

Mr. **Brown**. Thank you, Mr. Chairman.

Mr. Ruckelshaus, I think it's obvious to you that this whole committee shares a high regard for your leadership at the Agency, and we look forward to a continuation of the progress that you've already demonstrated in the year or so that you've been there.

Having said that, I have to go back and remind you of a little history. This committee set up an environmental research subcommittee about 10 years ago, and my first involvement with you was as chairman of that subcommittee. And in the process of investigations at that time we had a number of criticisms to make of the problems that the Agency had at that time. We intended them to be constructive. One of those studies was devoted to the so-called CHES study [Community Health and Environmental Survey]. We found that to be extremely weak in terms of the monitoring, the data collection, the quality control, a number of other things. We found a number of other areas in which there were inadequate programs, what we called at the time the Sulfur Program or the Sulfate Program or the SO_2 Program. And I can remember saying it to you then that we would like to help correct those problems, and we wouldn't like to come back 10 years later and find you still had them. And here it is 10 years later, and you still have them. [General laughter.]

Mr. **Ruckelshaus**. Fortunately, I wasn't there in the meantime, Mr. Brown.

Mr. **Brown**. I'm not trying to lay the load entirely on you, but I was struck as we went through here that you're about to initiate studies on how to improve national monitoring systems, for example. How to find out the effects of acidic rain on lakes and forests. These are problems we brought up 10 years ago. Now, what's the reason for that?

Mr. **Ruckelshaus**. Mr. Brown, I think that's a very good question. It is very clear to me, in coming back and attempting to wrestle with this acid rain problem, that had we had 10 years' worth of research at a relatively small cost to the Nation, we would be in much better shape to know today exactly what it is we ought to do. And the public demand for action is really outstripping our ability to determine what it is, precisely, that we ought to do. I can tell you first hand, it puts the administration and this Agency in a very difficult position to try to both follow the best science that we can develop, and try to be responsive to the public's concern about the causes and effects of acid rain. Why the Government doesn't tend to be very good at identifying these problems at an early stage, and doing the necessary research so as to be able to respond to them when either they are at the point at which response should be made, or when the public is demanding some kind of response, I'm at a loss to explain. But we're not very good at it; it may well be that we tend to deal with the crisis of the moment, and one of the things that I have discussed at some length with Dr. Goldstein is that we simply have to get better at this longer-range research; we have to understand better the problems we're going to face in the future, and we've got to make the case for it on the basis of it being a sound investment in the future. If the case had been made on acid rain research 10 years ago, that this problem was obviously real, and that it was going to come at us, and we'd better understand it better or we won't know what to do in response, it would have been a very wise investment for the country.

Mr. **Brown**. Mr. Ruckelshaus, it wouldn't have taken a very smart person—even a Congressman could understand that if you continue to double the rate of coal combustion every 5 or 6 or 10 years and inject twice as much sulfur into the atmosphere, at some point it's going to become a critical problem, one in which international repercussions are being felt and a lot of things like that. I'm really looking for this long-term solution. I'm not trying to pick on you particularly, and I'm wanting to suggest that maybe we've gone about it in the wrong way.

Now you have, as you've indicated here, set up some University Research Centers around certain problems. How much are they funded? Do you have any rough idea?

Mr. **Ruckelshaus**. Yes. I think it's $420,000 for each center per year.

Mr. **Brown**. We've had a water research program for a number of years. The President just vetoed the latest version of the authorization for distributing something roughly comparable to this to each of the States for water research, and you're pointing out how much water research we need here. Is there anything contradictory in that?

Mr. **Ruckelshaus**. Well, I'd have to see that veto message. Which water authorization is that?

Mr. **Brown**. State Water Research Program.

Mr. **Ruckelshaus**. I'm not familiar with that particular——

Mr. **Brown**. It doesn't involve your Agency particularly, but what I am saying to you is, and I'm going to ask you specifically, is it conceivable that maybe, recognizing the scope of the problem, the total ramifications of research in water and atmosphere and the other things, that maybe the EPA has a bigger job than it can do with the centralized focus that it has, the limited laboratories? Maybe we ought to try and set certain national goals and involve all of our resources, our great university research facilities for long-term toxicology, epidemiology, and water research, the basic research that we're still looking for. And conceivably by making this a national effort guided by the EPA—but at least, as far as the basic research part is concerned, letting it be carried on as an ongoing educational research effort or whatever, so that we can get the best researchers in the country, not just 1,100 or so many people that you have here; we might, 10 years from now, come up with some better answers. And I'm willing to give you another 10 years.

Mr. **Ruckelshaus**. Thank you, Mr. Brown, for giving me the 10 years.

Mr. **Brown**. But I'd like to feel that we're moving, that we're going in the right direction; and obviously, we didn't do this for the last ten years.

Mr. **Ruckelshaus**. Well, I think that certainly, if you take acid rain as an example, if someone sitting in my job or whatever job was wise enough to anticipate this was going to be the kind of problem it was, it would have been a fairly simple issue to start to address aggressively, as we're now doing on the research side. However, it isn't as clear, I think, as it might appear; the sulfur oxide levels, if that's the major culprit in acid rain, have actually been coming down since the middle 1970's as a result of the Clean Air Act, and it may have been anticipated 10 years ago that they would come down more rapidly than they have. So, in hindsight it's very clear that we should have done this; it would have been very wise to do that, and what we're trying to do is to develop ways of anticipating these problems in a calmer atmosphere, so that we can address them with the kinds of resources that are necessary. And we're in the pretty early stage of trying to do that.

Mr. **Brown**. But SO_2 is only one of the problems. I didn't get into toxic chemicals with you because I can deal with that in another committee, but you're giving us reports that indicate, if anything, we're falling further behind in terms of addressing the problems of toxic chemicals; and perhaps we need to deal with that in the same way. Decentralize that fundamental research on generic chemicals and let the best minds in the country go at it instead of your trying to do it all over there in ORD.

Mr. **Ruckelshaus**. Well, we obviously can't do it all, and we certainly don't have enough resources in the Agency to deal with all these problems. And I would be glad to explore with this committee or any committee the fundamental questions about what a research program should look like and how all of the governmental and nongovernmental programs should be integrated to focus on some specific problems that we can now identify that are going to get worse as time goes on.

Mr. **Brown**. Thank you.

Mr. **Fuqua** Mr. Chandler.

Mr. **Chandler**. Thank you, Mr. Chairman, and thank you, Mr. Ruckelshaus.

I would like to ask a question both about enforcement and research concerning arsenic levels. You're well aware of the problems of the Takoma smelter. If you could update me and the committee on that, I'd appreciate it.

Mr. **Ruckelshaus**. That's been a frustrating and long experience for me as well as, I'm sure, for the citizens of Takoma. We are in the process now of finalizing the risk data. We've had hearings, in addition to the very extensive workshops that we held in and around Takoma, to explain to the people what it was that we knew about the health effects of arsenic, what technology was available to reduce the emissions from the smelter, and what the various options were. And then as a result of those workshops, that effort to inform the people around the smelter, we held a hearing—a couple of hearings—in which many of the people who had attended the workshops came in and gave us their views. We are assimilating all that information plus additional risk information that we have developed ourselves, and are working with the State and regional air pollution control agencies on what technological fixes may be available for the company to reduce their emissions. As a result of all of that effort, we will be pulling that together toward the end of next month so that we can make a decision sometime this summer. But we are progressing on it, even though it has been slower than we would have liked.

Mr. CHANDLER. Is that to predict some type of regulation by the end of this summer?

Mr. RUCKELSHAUS. Well, I don't know. The decision that I have to make ultimately is whether the levels that the emissions can be driven down to are sufficiently safe that they can be permitted to operate under those conditions, or whether there'll have to be additional conditions set for their operations. But that's the judgment that I'll have to make, whether those levels that we can finally drive them down to are sufficient to permit them to operate.

Mr. CHANDLER. I was also interested in Mr. Brown's question earlier. On pages 5 and 6 of your statement, you're describing the new integrated cancer assessment program. How far along are we in the collection of knowledge of the risks to humans of contracting cancer from these various pollutants? Your term is "new, integrated cancer assessment program," and I'm wondering how new, and are you starting off fresh or are we somewhere in the middle of learning about this problem? Where are we?

Mr. RUCKELSHAUS. There are a number of aspects that I've asked this integrated cancer assessment or integrated toxic task force to look at. What I allude to there is one of them. Part of their assignment is to determine whether we have integrated across all of our program areas—air pollution, water pollution, hazardous waste—a sufficient coordination so that if we can control a particular toxic substance, a carcinogen, for instance, in the air, are we simply transferring it to the ground water by simply taking whatever sludge has resulted from that air control and putting it on the land, whereupon it leaches into the ground water? If all we're doing is moving toxic pollutants from one medium to the other we really aren't accomplishing very much; so we have—one charge to this task force is to make sure that there is adequate coordination among our programs so that this doesn't happen. As to the state of our knowledge on the relationship between cancer and air pollution, it's pretty gross in the sense that what we think we need to do is refine it and understand better what the total burden of air pollution might be on the population in terms of its carcinogenic effects and specifically as to given pollutants, what their potential for causing cancer is. And we know a lot about some, and we know a little about a lot of them. That gives us some concern and that's why we have beefed up this program.

Mr. CHANDLER. Thank you, Mr. Chairman.

Mr. FUQUA Thank you.

Mr. Boehlert.

Mr. BOEHLERT. Thank you, Mr. Chairman.

Mr. Ruckelshaus, let me say that I'm one who is glad that you are where you are; when you talk, frequently, the word frustrating crops up, and I hope they don't wear you down. I still think you're the guy in the white hat, sort of the Lone Ranger within the administration, dealing with a problem that I think is very serious, and that's acid rain.

You know, it's often said that we don't solve problems here in Washington, we just manage them. In some instances we don't seem to be doing very well, and this is one of those instances, in my estimation.

Last year when Mr. Ackerman came before this committee he said, and this is an exact quote—

> It is in the nature of acid rain deposition that actions have to be taken despite incomplete knowledge. If we take the view that we must wait until the scientific knowledge is definitive, the accumulated deposition and damaged environment may reach the point of irreversibility.

I happen to share that view. I don't need a study to tell me what causes death in war; it's bombs and bullets, and I don't think we need a lot more studies to tell us what causes acid rain. We know what the cause is; certainly we have to continue to study, but when the President appointed you last May he said this is a No. 1 priority. Those were his words. And I think you were somewhat enthusiastic about it. What's happened? Are they wearing you down? Or is this something that we really should be referring to the political scientists rather than the biological scientists?

Mr. RUCKELSHAUS. You've already been referred to the political scientists with a big "P." They're not wearing me down. The fact that I have not solved this problem or I haven't come up with a consensus doesn't make me unique in the society. Congress hasn't come up with a consensus, there is no consensus in the administration, there's no consensus in the country about acid rain. And in the country it's a regional problem, it isn't a political problem with a big "P." People differ in their view of the problem and what ought to be done about it, depending on where they live and what effect it will have on them.

My own view is that my responsibility is to push this research program as hard as I possibly can so that we understand more about the causes and effects of acid rain than we now do so that when we arrive at the point where the country is sufficiently convinced that we have a real problem here that we have to address and the way to address it is to reduce sulfur oxides or nitrogen oxides or both, or maybe more pollutants, then we will have done all the work that's possible to do. We'll have put in place the administrative mechanisms that can make a control program work, and that we can push it forward.

Now, if you think of people's conviction along a spectrum, along a single line, really, from those who think it isn't much of a problem to those who think it's a terrible problem, we ought to deal with it right away, there comes a point at which you move along that line; as your knowledge increases you move over to the side of those who say, I think we ought to control it. I think we ought to control SO_2 in order to reduce acid rain. Everybody in the Congress, everybody in the administration has not yet crossed over that line to determine exactly that we know enough now to start sulfur oxide controls. That's one question, are we certain enough scientifically about what the problem is and what we ought to do about it to start reducing SO_2.

Another problem is, how should we go about doing it? If prudence would dictate that SO_2 levels start coming down now, even though the gentleman you quoted says our knowledge is imperfect, then maybe we ought to start doing that. But if, in the current context of the debate, we have people on the one hand saying 12 million tons or nothing, and on the other hand saying OK, nothing, we don't have much conversation going on between those two groups that would lead toward some solution that might be short of what either one of them would want but would at least start us heading in the right direction. And at any rate, I think we've got two kinds of problems. One is to push people to the point where they think controls are necessary, if that's the direction we ought to be going; and second, to get the various regions of the country starting to talk to one another.

Mr. BOEHLERT. Excuse me. Would you say there's recognition now within the administration that this is truly an international problem, not just a national problem, and no longer regional problem?

Mr. RUCKELSHAUS. Surely. No question about that.

Mr. BOEHLERT. I mean, you have to be concerned—I know you are, and I assume others in the administration are very concerned—about the protest coming from Canada, for example.

Mr. RUCKELSHAUS. There's no question that the administration is aware that the Canadians have made it very clear that this is a problem for them for which they place a very high priority. It's a protest note—they couldn't make it any clearer.

Mr. BOEHLERT. Well, you know, the governor of my neighboring state came up with a pretty quotable quote, Governor Kean of New Jersey said, "If all we do is more research, we're going to end up with the best documented environmental disaster in history." And I'm very supportive of that statement.

I think it really boils down to—it's a political problem with a big "P." How about the possibility? Now, I know that you've presented several options within the confines of the White House. What about the possibility, since this seems to be such a monumental political problem, of a commission to review, recommend, very similar to what we have done with Social Security?

Mr. RUCKELSHAUS. It would be a wonderful idea if nobody had done it before. The problem with commissions is that we've used so many of them that I think people have gotten a little cynical about them.

I don't think it's a political problem with a big "P." I think it's a regional problem, and what we need to do—there are people in both parties, for instance, who live in the Middle West who believe just as they do in your part of the country, and I think what we need to do is start getting the various regional groups in the country talking to one another, and maybe a commission is the way to do it. Whether that's possible in 1984 or not, I have some doubts, but that may be ultimately what we have to do in order to get people to stop shouting at each other across this very wide chasm of 12 million tons or nothing, which is where the debate is currently going on.

Mr. BOEHLERT. Well, obviously, compromise is very much in our vocabulary here in Washington and a compromise may well be in order. But it seems to me that the 12 million tons or nothing, we're getting the nothing from the administration, other than from you.

Mr. RUCKELSHAUS. Well, to say we haven't moved at all on it, I think, is not so. We have done a lot. Whether we want to go forward with a program now or not has nothing to do with the research; we need more research in this area, we need a lot more——

Mr. **Boehlert**. I'll grant you that.

Mr. **Ruckelshaus**. [continuing]. We need more on the lakes, on the forests, on all the aspects of acid rain. And this research budget has doubled, where we're requesting—more than doubled for EPA, and doubled total for 1985. It is a very serious undertaking. We are pushing it as hard as we can. The original research was laid out by the Congress in 1980 as a 10-year program. Try to understand that we're really about in the second year of it, and the frustrating thing to me—you asked me if I am frustrated—is, I asked these scientists, what are the answers to all these questions? And they say, well, we'll get it in 1986 or 1987. And that's the way the program was originally structured. That was the signal they got from the Congress as to how they were to proceed. And now public opinion has overwhelmed this research effort with conviction, at least in the parts of the country that are most adversely affected, that we know what the problem is and we ought to get on with solving it. And there are other parts of the country that haven't arrived at that conviction yet.

Mr. **Fuqua**. The time of this gentleman has expired.

Mr. McCandless.

Mr. **McCandless**. Thank you, Mr. Chairman.

I thought when I joined this committee I might be able to find a solution to the common cold, but we haven't been able to whip that problem yet so we'll talk about air pollution, if I may, Mr. Ruckelshaus.

I appreciate your return to Washington. It's very much a plus for the Agency, and I applaud you for taking on the assignment.

We're somewhat regional in our approach here today and I'd like to also follow that line. The Los Angeles Basin, primarily the counties of Los Angeles, Orange, Riverside, and San Bernardino make up approximately half the population of the State of California, a 20th century, urbanized, industrialized society, trying to wrestle with the Clean Air Act, maintain a certain level of occupational jobs, carry on the daily activities of life. From a scientific point of view, and that's what we're here for, State implementation plans have been submitted; air quality management plans at the district and regional level have been submitted; deadlines of the Clean Air Act have required accomplishment; extension of deadlines are possible.

From your point of view as the Administrator, having been the first and now back some 10 years later, as I understand it, where are we going with the Clean Air Act and these plans to try to handle such an urban, industrialized community as Los Angeles or, for that matter, many of the others in the United States?

Mr. **Ruckelshaus**. Well, Los Angeles, in some respects, is unique in that it has a set of problems that— other than possibly Denver and Phoenix—associated with the automobile, other parts of the country don't have with quite the same severity. And the newer automobiles that have come online are so much cleaner than the older ones, that a lot of the problems associated with the automobile are well in hand in much of the country.

The problem in Los Angeles is the much longer-range problem. You've got very large automobile populations, a lot of sunlight, a lot of still air; and that combination of atmospheric conditions, automobiles, and the nitrogen oxides and hydrocarbons which interact with that sunlight and cause smog are what cause your problem in Los Angeles. I have believed from the beginning, and so testified when I was here before, that to take the Clean Air Act and to set deadlines in it that we know when we set them are impossible to achieve, doesn't do anything for us in Los Angeles. All it does is doom us to failure before we ever start, and it gives, I think, unfortunately gives the impression of people living in Los Angeles, or maybe even more so living outside that area and watching it, that we're not getting anywhere, that we're not making any progress. And, in fact, I think we are, and California has taken the lead, really, in trying to control air pollution in the past and still does. They've submitted a State implementation plan. If it does not achieve the standards by 1987 under the current Clean Air Act, I am limited in how much flexibility I have to provide them some additional time to meet it. It really has to be done, ultimately, by the Congress.

I think I should have—I think the Administrator of this Agency should have more flexibility to deal with problems like Los Angeles, where they're doing everything they know how to do to achieve standards within a reasonable timeframe. That should be acknowledged, and we should not be forced to impose sanctions on them that really don't make any sense because there's not an awful lot left that they can do. I have been pleading this—I say, when I was here before, and when I was here in between, when asked to testify, and it falls on deaf ears here. When the Clean Air Act debate started in the Senate in 1981, I testified—as did Russell Train and as did Doug Costle, three then-former Administrators of EPA—all three of us talked about the Clean Air Act. We said different things about it, but there was one thing we were in complete agreement on, and that is the Administrator of this Agency needs more flexibility in dealing with the problems associated with the Clean Air Act than he now has. The Congress has never been inclined to give that flexibility, and the reason is really a question of trust, is what it really boils down to. And there are reasons, historically and otherwise, for the Congress to have some misgivings about EPA; but I think that lack of flexibility really forces us into very bad solutions on occasion.

Mr. McCANDLESS. Thank you, Mr. Ruckelshaus.

Thank you, Mr. Chairman.

Mr. FUQUA. Thank you, Mr. McCandless.

Mr. Glickman.

Mr. GLICKMAN. Thank you, Mr. Chairman.

Mr. Ruckelshaus, I want to ask you a question on a subject that you may not be aware of, but I want to get it for the record and ask you to respond.

The hazardous waste facility near Furley, KS, which is near the Fourth District, where I live, has been closed for 2 years after it was discovered that hazardous chemicals had leaked into the ground water. Only after further ground water tests were conducted at the insistence of this committee was it discovered that some of the test wells were contaminated by dioxin. And although the State has conducted some ground water tests around the facility, no comprehensive ground water tests have been conducted. I have written the EPA twice requesting such tests and have not received a satisfactory response. I wrote to the Regional Administrator, Mr. Kay, and I think I also wrote to you.

My question is, Will you direct the EPA to conduct a complete ground water evaluation for all parameters of the hazardous waste that has been disposed of at this site, including the testing of ground water near the homes around the site?

Mr. RUCKELSHAUS. Well, I'll certainly review that. I find it difficult to respond to that question——

Mr. GLICKMAN. OK.

Mr. RUCKELSHAUS [continuing]. Right now, but I'll certainly look at it and get back to you.

[Material referred to follows:]

In response to Congressman Glickman's concerns, on March 29, Morris Kay, EPA Regional Administrator in Kansas City, Kansas met with the Congressman and staff, as well as with representatives from the offices of Senators Dole and Kassebaum, to provide a status update on the National Industrial Environmental Services, Inc. (NIES) site in Furley, Kansas. Mr. Kay discussed ongoing EPA activities at the site such as groundwater monitoring and evaluation of water quality data. EPA's laboratory in Ada, Oklahoma was concluding its review of all data and reports already available on the NIES site to determine if additional testing would be necessary. EPA has provided the Congressman with a summary of the findings by the Ada lab and information regarding monitoring sampling frequency at the site and deep well injection.

Mr. GLICKMAN. It's a very high priority to the citizens of Kansas and it doesn't look like the Federal or State regulators have moved as quickly as they should, so would you please review it.

Mr. RUCKELSHAUS. Yes, sir.

Mr. GLICKMAN. My second question is, why is there no clear EPA policy or regulation by which new technologies can be verified or approved for use by the EPA as feasible alternatives to land disposal of hazardous waste? You know, it looks like to me that almost all of your money in hazardous waste is going to make better Glad Bags, make thicker bags that go on top of the site so that the leakage might take an extra 5 years to seep through, as opposed to having some sort of policy by which alternative land disposal can be approved. We've got ourselves into a "Catch-22" situation under RCRA where, in effect, if you look at the basic law, companies may be discouraged from moving toward alternatives to landfill; and yet we have no options, no clear options for small or big business as to how to dispose of this waste, other than spending money on making those Glad Bags that fit on top of the ground a heck of a lot thicker.

Mr. RUCKELSHAUS. We do have a considerable amount of research going into alternatives. Some of it depends on your sense of what the Government's role ought to be. Should we actually be doing the research for alternatives and trying to transfer that out to the private sector, or should we be trying to encourage research in the private sector for these and designate which are acceptable and which are not? We have a task force that has been established over the last couple of months to address that whole question involved in alternatives to landfill. It's very clear that the Congress is saying, "We want more and more chemicals out of landfills that may cause any potential hazards to ground water." And trying to get alternatives for treatment of those chemicals, in the meantime, is very important.

Mr. GLICKMAN. But if I may just interrupt you for a minute, a March 1983 OTA report titled, "Technologies and Management Strategies for Hazardous Waste Control," it concluded that all hazardous waste landfills will eventually leak, without exception. And the same report added that 90 percent of your hazardous waste research budget goes for various aspects of land disposal. I guess what concerns me is that there is such an unbalanced emphasis on land disposal versus the other disposable options. I mean, it's the same problem that we've had with Times Beach and the Superfund sites all over the country. This committee, when we took the EPA R&D bill to the floor of the House, provided a set-aside of at least 25 percent of the hazardous waste research be in other technologies besides land disposal.

I guess what I'm trying to get from you, Mr. Administrator, is, are you committed to moving the R&D side of your operations toward finding options besides spending money on making land disposal better?

Mr. RUCKELSHAUS. Well, there's no doubt we have to do that, because you are right—they leak. That doesn't mean that all substances shouldn't be put in the landfills. There may be some for which that is the best treatment.

We have increased our alternative technology research. For 1984, it's $3.6 million; for 1985, it's $5.2 million, in response to that very question that was raised not only by OTA but by others. And I would be glad to provide for you and this committee what that research budget is aimed at doing, what alternative technologies we are looking at. The push away from certain kinds of chemicals being disposed of in landfills is very concerted; and, in the case of a lot of these chemicals, wise. We have to have some way of treating them. So it is our job, it seems to me, both to try to develop technologies if there's no development effort going on in the private sector, or at least to find out what alternatives there are and see if we can't transfer them so that they're available for people who need them.

[Material referred to follows:]

The hazardous waste research program includes a comprehensive program that is developing and evaluating alternative technologies to land disposal. Examples include:

(a) thermal destruction processess—incineration, industrial co-firing processes (boilers, kilns), wet air oxidation, plasma arc, high temperature fluid wall reactors, molten salt, fluidized bed.

(b) biological destruction—in-situ detoxification (e.g. special yeasts, fungi, and genetically altered bacteria), industial treatment processes.

(c) chemical destruction—ultraviolet photolysis, in-situ dehalogenation of soils with radiofrequency heating and chemical reagents, such as alkali polyethylene glycols (APEG).

(d) physical methods—chemical fixation, chemical encapsulation.

Mr. GLICKMAN. OK. Well, I appreciate your response. I would again point out that it looks to me as if there is, historically, perhaps before you came to this job, unbalanced emphasis on land disposal versus the other disposal options. And you may have moved your numbers up a little bit, but that's one of the reasons why we wanted to get you to earmark or target more of your funds for these options because the handwriting is on the wall; the days of land disposal are gone in America. And yet, for many parts of this country, for many businesses, it's still the only way that they now have to do it other than deep injection drilling and other things which may cause us more problems down the road, and I just would urge you to continue trying to redirect some of your efforts in the alternative.

Thank you, Mr. Chairman.

Mr. FUQUA. Mr. Volkmer?

Mr. VOLKMER. I'd just like to echo what the gentleman from Kansas says about landfills, and also, hopefully the Agency will make sure that the monitoring of these landfills is maintained at very high levels.

The other thing I'd like to comment upon—as we started here today—you were testifying and didn't notice, I had a large group from my district and also from the State of Missouri that are farmers here, and I told them, I'd like to ask you one question with regard to leaded gasoline. As I understand it, you are proposing to eliminate the use of leaded gasoline in the United States. Do you realize that much of our farm equipment, farm tractors, et cetera, still uses leaded gasoline?

Mr. RUCKELSHAUS. Yes; I do.

Mr. VOLKMER. How do you propose to take care of that situation?

Mr. RUCKELSHAUS. What we are doing, Mr. Volkmer, is looking at the current phasedown schedule for leaded gasoline which was tied to the introduction of new automobiles that are using the catalyst that cannot take leaded gasoline because it's poisonous to the catalyst. The catalyst is there to control other pollutants.

The phasedown schedule indicated that as the new cars came on line, leaded gasoline would phase out toward the end of this decade, the beginning of the next. The problem that we're having is that people are tampering with these catalyst devices, either taking them off or putting leaded fuel into the gas tank and poisoning the catalyst. That is occurring now in about 17 percent of the automobiles that should take unleaded fuel. Stopping that is a very complicated procedure. We don't have very good tools for doing that as it relates to the individual automobile driver, or for the individual gas station, for that matter. We are looking at all kinds of ways of stopping tampering. We continue to be concerned about the impact on health of lead in the atmosphere, and we were satisfied that that phasedown schedule was going to take care of it. Now, if that phasedown schedule isn't going to work, then we need to look at new ways of achieving that same result. That's what we're in the process of doing.

Obviously, if there is a requirement for leaded gasoline in farm equipment or farm machinery, then we have to accommodate to that in terms of setting any kind of schedule that might result in the elimination of lead. That same problem would have existed under the phasedown schedule we are currently on but for the tampering with these automobiles.

Mr. VOLKMER. You would plan, though, to accommodate the agriculture community in that area?

Mr. **Ruckelshaus**. I think we have to accommodate any vehicle that has, as one of its specifications, the need for a certain kind of fuel additive.

Mr. **Volkmer**. Well, we also, I think, should recognize that the quantity of lead in the air as a result of the use of farm machinery is a lot different than traffic in the cities.

Mr. **Ruckelshaus**. That's right. Yes; I agree.

Mr. **Volkmer**. I appreciate that.

The other question I have, pertaining also to the State of Missouri, is the problem of 2378 TCDD, commonly called the dioxin problem, and the research being done on that. Last year there was $2 million given to EPA for dioxin research, and I'm a little concerned that only $130,000 was used for transport and fate studies in regard to the dioxin. I recently had an amendment adopted to your authorization bill for research and development here, and it's now over in the Senate, that would propose the use of $1 million for fate and what we call artificial or enhanced degradation. The reasoning for that is that the cost of disposing of soil contaminated with dioxin is just prohibitive; and somehow we've got to find other ways. I have been assured by toxicologists and others who have studied this, that this may be one of the best approaches. And I'd like to know, if Congress does adopt that language and provide for that $1 million, whether you would proceed with using it for that type of study?

Mr. **Ruckelshaus**. If the Congress directs it, we certainly will, Mr. Volkmer. Obviously, whatever the Congress says we should do, we will.

I have seen some of the efforts going on to try to detoxify dioxin in the soil. Obviously, if we could do that, that's a preferable solution to transporting across several miles and storing it someplace else where nobody wants it. So we are as interested in achieving that as anybody, and I guess it's a question of how much money you can put against that problem and expect to get some results. We had a lot of work going on in that area, and to this date we've had some success in the laboratory, but transferring it into the field has been difficult.

Mr. **Volkmer**. I appreciate that.

And the final comment I'd like to make is that I'm one of those who finds that your approach—and so far, the approach that's been followed on the question of acid rain—is not necessarily the wrong approach. I still think we need to know more about transportation of the sulfur oxides. As being one from the Midwest whose people would have a severe impact on the 12-million-pound reduction, I want to make sure that when that's done it's going to do the right thing.

Thank you.

Mr. **Fuqua**. Thank you.

Mr. Scheuer.

Mr. **Scheuer**. Thank you, Mr. Chairman.

Mr. Ruckelshaus, it's always good to have you back again.

You testified that you have added significant funds for acid rain research, and indeed you have. Did you receive all of the funding that you requested from OMB for acid rain research?

Mr. RUCKELSHAUS. No; we did not, Mr. Scheuer, but we did receive all of the funds that were recommended by the Deutsch Committee. We appointed——

Mr. SCHEUER. By the which committee?

Mr. RUCKELSHAUS. The John Deutsch Committee. When I came back, I appointed John Deutsch, who used to be the Undersecretary of the Department of Energy and now is at MIT, to take a look at the Government's research program. He convened four or five other scientists who were experts in this area, and they took a look at the total research budget. It was their recommendation, about $55.5 million, that we have followed in this research budget. I'd be glad to share that report with you. I think it's been made public, but if it hasn't, I'd be glad to give it to you.

Mr. SCHEUER. I can't let OMB off the hook that easy.

Mr. RUCKELSHAUS. I'm sure you're not, Mr. Scheuer. [General laughter.]

Mr. SCHEUER. On December 2, 1983, three of the Chairs of the National Acid Precipitation Assessment Program wrote Fred Khoudari of the Office of Management and Budget that the joint Chairs—now, that includes Dr. Lester Machta of NOAA; Dr. Orville Bentley, Assistant Secretary of the Department of Agriculture; and Dr. Courtney Riordan of the EPA—the joint Chairs are disappointed that new money has not been provided for this crucial program, and they're referring to the budget for the National Acid Precipitation Assessment Program.

Now, some might argue that the OMB-approved funding levels are acceptable since they are significantly higher than fiscal year 1984 levels; but in conjunction with your apparent failure, spirited as it may have been, your effort to achieve support for your modest proposed regulatory program for acid rain, this failure to achieve your funding request that was supported by these joint Chairs only serves to reinforce the view that when the administration debates environmental issues, senior environmental officials are ignored.

Now, we are very frustrated here, and I suppose you are frustrated, too. Maybe you could tell us—I don't want to ask you a stupid question like, are you frustrated?—we're all frustrated—but maybe you could tell us, how was it under President Nixon? Did you have more input? Did you have more flexibility? Did you have more independent decisionmaking, as compared—did you have more access? What is it that explains the fact that you, as the senior environment official, and the one who came back in an enormously prestigious environment, let us say, when you were appointed, to save this failing agency that was in the public mind going down the tubes—and you have saved it, you have turned it around—and now that you have turned it around, you are trying to make it go forward, as everybody wanted you to do, and is pulling for you to do, and expected you to do and hoped for you to do—how is it that coming in, when the President said when he appointed you, "I would like you to meet this issue head on," the issue of acid rain. I was there in the White House. I was standing 20 feet from you when he said that. I was absolutely excited. And here we are a year later, and virtually nothing has happened.

What are the institutional rigidities or impediments that have produced this colossal frustration on the part of many of us here?

Is it lack of access? Is it lack of independent decisionmaking authority on your part? Is it, compared to the Nixon years——

Mr. RUCKELSHAUS. Mr. Scheuer, first of all, let me straighten out one thing, and that is that what the letter was referring to was that the moneys that had been appropriated for acid rain prior to the Deutsch Report in agencies other than EPA had not been new money. They are referring in that letter to new money that had been taken out of their base research budget. As the Deutsch Report pointed out, this made it unlikely that those agencies would be very enthusiastic about the research effort, and he recommended very strongly, he and his committee did, that the acid rain research moneys be new money. They are new money. That effort—that recommendation has been carried out with my support, and those requests now are new moneys, just as the money is coming to EPA.

Let me try to answer your broader question on access. I have all the access I need today; I had all the access I needed under the Nixon administration. You know, there's a difference between the right to be heard and the right to be heeded. And just having access on an issue like acid rain where, if you ask the people on this committee what they think about it, you'll get views all over the map—the same thing is true within the administration. And I presented, as I thought it was my responsibility, a range of options for the President to choose from, ranging from the one which he did choose, namely, which was to accelerate the research effort to try to find out more about it, all the way to the most extreme option that's been recommended here in the Congress. And the President, he's the one that has to make this decision in terms of what the administration would do. He is not, as of this point, where he thinks we know enough about what we ought to do in terms of the control strategy for his administration to recommend it.

Mr. SCHEUER. Let me ask you, with the chairman's indulgence, one last question.

Can you give us a timeframe within which you would expect that this President would have the knowledge base, the data base, to make a decision, if not to do everything, to do something? You see, our problem is that we feel you folks up there feel you have to know everything before you can do anything. Isn't there some quantum of research data, less than the optimum, less than absolute knowledge, which will never happen in this field, that would give you confidence at least to move ahead on the first of perhaps several incremental steps? I'm not talking about going ahead with scrubbers, the universal mandating of scrubbers; that's what the Japanese have done. But isn't there some lesser step, some modest proposal, as Jonathan Swift would put it? Isn't there a modest proposal that could be validated by research that we either have now or could have soon, that you could say, well, we can't do everything, but at least this first incremental step is clearly cost-beneficial, it's clearly sensible, it's clearly justified by our admittedly incomplete data base now? Can you see a timeframe in which the President could have that kind of a knowledge base?

Mr. RUCKELSHAUS. There are those who have studied the information that we now have who have arrived at the point that we ought to at least be doing that; some have arrived at a point clear beyond that, and say we ought to be doing something much more drastic. You're in effect asking me to get inside the head of somebody and say, what are they going to do, given a certain set of facts? The President certainly isn't alone in not having arrived at the point where he thinks that we know enough to know what to do. But as we accumulate information, as we accumulate evidence, assuming that evidence points in the same direction, that we ought to control SO_2 to do something about it, then I would presume he, at some point, would be pushed to the stage at which he'd say, yes, we now know enough and here's what we ought to do. As to exactly when that will happen——

Mr. SCHEUER. Is that a 10-year process, a 5-year process? A 3-year process?

Mr. RUCKELSHAUS. No; I think we're a couple of years before most everybody is going to conclude—assuming that the information that we're accumulating heads in the same direction. The difference in talking about this issue to the scientists who are studying the problem and talking to the general public is night and day, as far as I'm concerned.

There are still a lot of questions involved in all of this. The difference in the society between saying, we know enough now that prudence would dictate we started down, which is at a reasonable cost, and saying we ought to go like this, which is a very heavy cost in terms of both economics and social disruption, is really a big difference. And this is 12 million tons; this is heading downward so that as we learn more, if we want to go down faster, we can do it. But do we know enough to do that yet?

Now, where the problem is, we're locked on either nothing or 12 million tons. That's where the debate is.

Mr. SCHEUER. Thank you very much, Mr. Chairman.

Mr. FUQUA. Mr. Lewis.

Mr. LEWIS. Thank you, Mr. Chairman.

Mr. Ruckelshaus, I'd like to add my compliments to your running of the Agency as well. I think it was certainly a step in the right direction to clear up a very dusty area.

I have a concern, as many others, with the dioxin and the Temik and the EDB's and the PCB problem. What would you consider EPA's responsibility in the area of trying to come up with a more rapid or speedy method in its research, in the research areas, to make a determination as to the effectiveness of these types of compounds? We find that we can use a miracle-type herbicide or pesticide or transfer agent, and we use them and then we find 5, 6, 7 years later that they're carrying traces that cause cancer and that sort of thing. We find again that, well, if we cut back on the dose used and the amount used, what percentage is used in a liquid base with something else, that it can be used safely for periods of time.

How can we accelerate the research in this area, and what is the Agency's responsibility in this area?

Mr. RUCKELSHAUS. Well, I think our responsibility is manifold. In the first place, it is to try to construct a research program to get answers both over the long term and over the shorter term as to the health effects of the whole variety of chemicals that we use. It is also the Agency's responsibility to communicate to the public as clearly as we know how that while we do have a lot of scientific uncertainty today, if we put up against that uncertainty a very aggressive research program that is well managed, directed at the biggest problems that we have, we are still going to have scientific uncertainties.

One of the things that struck me on coming back to EPA, and it struck me when I was first there, is how difficult it is to make decisions in the face of this enormous scientific uncertainty and scientific debate that occurs. The public is not inclined to be very sympathetic when you tell them, we're just not sure this particular substance, at the levels at which you're exposed to it, may cause some kind of problem for you. We just aren't certain. We think we know enough about it that at the levels we've driven it down to, you're all right, but if you ask me to give you an absolute, 100-percent sign of certainty, I can't do it. And while we have substances like DDT, as an example, which at the time it was finally phased out had probably been studied more than any pesticide in the history of man—and each time a new study would come back, there would be 20 new questions that they raised that ought to be answered—well, just as on the issue of acid rain, there comes a point at which you say, well, we know enough on the basis of what science has now produced to take these kinds of steps; that's the kind of activity we're engaged in. And under the pesticide law, we're supposed to weigh the risks as we currently know them, balance them against the benefits to society—that's often particularly difficult in pesticides, because pesticides aren't often any good unless they kill something, that's what they're for—so, by their very nature, they're toxic, they're potentially dangerous. And if they hit the nontarget species like man, they are particularly loathsome to us.

I think we do have in place now a screening system for the registration of new pesticides, the kind of program where direct kinds of health tests are done before the pesticide is registered. Where we need to do more aggressive, more accelerated work is on the pesticides that have been registered in the past when we didn't have measurement techniques and we didn't have health studies that would give us more definitive answers on their effects. We need to go back and take a look at those to make sure that we don't have, widespread in the environment, pesticides that cause us considerable problems.

Mr. Lewis. Within your budget, I would like to get some idea of the percentage of your budget that is used for long-term research and particularly in the area of hazardous waste disposal devoted to land disposal.

Mr. Ruckelshaus. We have a number of ways of answering that question. In my opening statement, I indicated that both in exploratory research and in grants research, which is what we think of as long-term research in a kind of generic sense, we will be spending something like $13 million this year. If we—we have them broken out, program by program, whether it's air, water, drinking water, hazardous waste, in all of those toxic substances and in all of those programs, the moneys that we are spending on long-term research, the research that goes on 3, 5 years and beyond, that total is about $57 million. That's on the hazardous waste—$2.7 million is on hazardous waste, but we have $7 million on toxic substances. I mean, it's not just hazardous waste in which we're doing the kind of research I think that you're concerned about, the long-term research. But that's the best breakout we can give it, and it's about $57 million of the $278 million base.

Mr. LEWIS. Thank you, Mr. Ruckelshaus.

Thank you, Mr. Chairman.

Mr. FUQUA. Mr. MacKay?

Mr. MACKAY. Mr. Ruckelshaus, this is a very encouraging hearing to me and your written statement is very encouraging. The reason it is encouraging, it seems to me you started out trying to talk about the goals, where you're headed, and then you put everything you have said in the framework of those goals, and that's very helpful from the standpoint of our committee which is in some ways the sort of forward-looking radar of the Congress. We're supposed to be trying to see whether the research priorities are straight and where we're headed; as I understand it, that's what this committee is all about.

I'd like to just ask you a couple of questions. You raised at the outset the distinction between long term and and short term. It seemed to me you were saying you were not yet satisfied that you've got the proper balance between short term and long term, but that you're trying to redress that imbalance. The thing that bothers me is, when I try to think of Federal agencies which have the responsibility for dealing with problems out on the horizon, particularly in the environmental area, I come to the conclusion that you're it; I mean, you may not be much, but you're what we've got. [General laughter.]

Now, that's my language and not yours, but it concerns me that in the framework of long term/short term, what you're really describing is critical—which you're saying is short term, not just you but all of us; we tend to think of something that's got to be done by next Friday, that's short term, and long term is something in this budget cycle.

Now, my question is, what about long term in terms of our kids and their kids? I am very much worried that we don't have an oversight or a foresight capability that goes out beyond the short-term dimension of acid rain and asks the question, what is going to be the cumulative impact of the continuing depositing of sulfur dioxide and metals and other things on our soils and, basically, the potential of sterilizing our soils? And one of the people we talked to earlier said there is beginning evidence that fouling up the lakes and killing the timber may not be the real problem. The real problem is, we may render the soils sterile.

Who, besides you, is investigating that? What are you doing? Do you see that as a valid long-term concern?

Mr. RUCKELSHAUS. That concern was raised in the President's own Science Advisory Committee. Ruth Wiener, who was on that committee, was one of the people who raised it. We do have soil research in the Acid Rain Research Program; that specific problem, we do have in the Acid Rain Research Program now. The Acid Rain Research Program is expanding very rapidly and we are looking at all aspects, both causes and effects, of acid rain in addition to this technological piece of it here that is shared by both us and the Department of Energy. So that is one problem that we are doing a lot of research on, quite aside from where you stand on whether we know enough now to go ahead with a control program. We really are trying to get at that.

Your more generic question, I think, is a good one. I think it not only relates to EPA; it relates to the Government as a whole.

Mr. MacKay. I'm asking that question: Is not part of your function one which necessarily makes you a lightning rod, but it's the early warning function? I mean, we do have a tendency to kill the messenger that brings the bad news, and you're—that's part of your job—is bringing that message. But who, besides you, has that responsibility?

Mr. Ruckelshaus. Well, really, there are other research agencies in the Government—National Institute of Environmental Health Sciences has a more basic kind of research responsibility. I am chairman of the National Toxicology Program, which pulls together a number of agencies looking at certain chemicals that ought to be researched over time. So there are longer range—now, we have been trying to better coordinate the research of our Agency and all of these other research-oriented agencies of Government——

Mr. MacKay. I wanted to ask that. I saw that on page 6, and that's an intriguing statement which, I take it, was meant to be nonspecific. "We are investigating the possibility of coordinating our risk assessment guidelines with those of other major regulatory"—my God, do you mean that's all that's being done?

Mr. Ruckelshaus. No; well, we're doing more than that. That's a different subject, too; that's not long-term research. This is the question of cancer guidelines, for instance. The way in which EPA assesses the risk of cancer is not necessarily the same way that the Food and Drug Administration, OSHA, Food Safety Agency of the Agriculture Department, Consumer Products Safety Commission—I have convened the heads of all of those risk management agencies. We've had a couple of meetings; we're in fact meeting again next week and one of the things we're trying to do is look at the ways in which we assess risks to see if we can't all do it on a common basis.

Mr. MacKay. Well, I think that's why I asked the question the way I did. If you really are a long-term—you are a looking-over-the-horizon person, or your Agency is, should there not be a dimension where you have the ability statutorily to critique or at least see to it that this long-term dimension is part of the research that's being done throughout Government?

Mr. Ruckelshaus. If you had to ask me if that responsibility should be lodged somewhere in the Government, and I think it should, should it be put into a regulatory agency? And I guess I would say, I don't think so. I think you ought to divorce it from the immediate regulatory responsibilities which we have, which often dictate where we put research money simply by necessity. If you were talking about just environmental or health-related research, it might be better placed in an agency somewhat more divorced from the immediate regulatory responsibilities we have. The Council on Environmental Quality is one place where that kind of function could be located, although they don't have the health kinds of responsibilities. It could be located at HHS.

Mr. MacKay. I saw that statement also in your opening, which was in the context of research as applied to a regulatory agency, and I wondered if you were driving at that. The point that I thought you were raising is the question of whether we are set up to do long term, whether there is anybody in Government today who has got the budget and the authority to really be thinking through these long term——

Mr. Ruckelshaus. I don't think there is. There's some of that going on but it's not done systematically, it's not done carefully, it's not done with a specific designation of "this is what you're supposed to do." We issued a report on the warming effect on the planet that caused all kinds of stir here several months ago. There you were looking at 40, 50, 60, 70 years——

Mr. MacKay. You see, I don't consider that long term. That's intermediate-term. [General laughter.]

Mr. Fuqua. The time of the gentleman has expired.

Mr. Walker.

Mr. Brown. If we could get out that far, I'd feel pretty happy.

Mr. Walker. Thank you, Mr. Chairman.

I have some concerns with regard to the situation at Three Mile Island. Since the accident, the EPA has been monitoring the water quality there. This primarily came about as a result of the research and development work that's going on there and the experimental nature of it; it was felt that there was a need for EPA water monitoring activity to assure the local populace that contaminants were not going into the waters that end up in the drinking water supply; also, to assure that the Chesapeake Bay was not contaminated by something that went on at Three Mile Island.

Recently there has been talk of withdrawing the EPA monitoring activity at Three Mile Island. I'd like your comments on that and, really, what I'd like is some assurance that EPA is not going to back out of that at least until all of the research and development work the Federal Government is doing at the Island is completed.

Mr. Ruckelshaus. I don't know where that talk came from of what the status of our monitoring activities are there. It's hard for me to believe that, given the current and ongoing concern expressed about Three Mile Island, that we would stop whatever monitoring we have going on there, but I'll find out about it and let you know.

[The material referred to follows:]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR, NOISE AND RADIATION

BACKGROUND INFORMATION REGARDING EPA MONITORING AT THREE MILE ISLAND

Since March of 1979, the Environmental Protection Agency (EPA) has monitored radioactivity in air and water in the communities surrounding Three Mile Island. The Pennsylvania State Department of Environmental Resources, General Public Utilities, and the Nuclear Regulatory Commission (NRC) all conduct substantial monitoring programs as well. While occasional samples have been above the minimum detection level, none of the samples have indicated levels of radioactivity in air or water that are above standards for protection of public health.

On February 9, 1984, Mr. Glen L. Sjoblom, Director, EPA's Office of Radiation Programs, met with the NRC's Advisory Panel for the Decontamination of Three Mile Island Unit 2 and discussed environmental monitoring with the Advisory Panel and EPA's concern that much of the present monitoring is duplicative and redundant. The Advisory Panel is composed of State and local officials, scientific experts, and citizens from the communities around Three Mile Island.

During the meeting, the Advisory Panel noted and EPA agreed that the Agency continue its role in monitoring activities at Three Mile Island. It was agreed that all major participants in the present monitoring activities at Three Mile Island would meet to design an updated monitoring program. Dr. William P. Kirk, Director, Three Mile Island Field Station, has been given the lead in conducting a review of the present program and future needs. The first meeting of the major participants of the monitoring program will take place in late March 1984. A report on recommended monitoring activities should be available within the next 2-3 months. The report will be submitted to the Advisory Panel for public review and comment before any changes in the monitoring program would be made.

Mr. **Walker**. I would appreciate that because, as I say, it's very important for the assurance of the local people. Part of the issue has been here that there are several different groups doing some monitoring there, including the company, and the question now arises in the people's minds as to whether or not there ought not be some independent judgment. The EPA has been that source of independent judgment, and I would certainly urge you to keep the EPA monitoring in place at least as long as there's a Federal presence there doing rather unknown research and development at the island.

The other issue that has some relationship and is also in the research and development area that could as well affect my area of Pennsylvania is the plans to go ahead with the Chesapeake Bay Cleanup Program. That has an impact because we do have a number of feeder streams into the Chesapeake Bay that go right through the farm areas. There's certainly a concern among the agricultural community in my area that the cleanup program could have its most long-range impact on the agricultural community. Can you give me any kind of feel for that?

Mr. **Ruckelshaus**. The Susquehanna River, which I think is the main one that you're referring to, does provide a good percentage of the nutrients, particularly for the upper part of the Chesapeake Bay. What we have requested in fiscal year 1985 is a $10 million appropriation for purposes of looking at the broad, nonpoint source, agricultural runoff kinds of problems that are leading to some of the excessive nutrients coming into the bay. We don't have any particular regulatory program in mind; we do think it's going to be necessary to control those nonpoint source runoff problems in order for the bay to be brought back. The State of Pennsylvania, the State of Maryland, the State of Virginia are all working on the same kinds of problems. Many of them have made independent appropriations from their State-taxing sources to see if we can't come together around that problem and solve it together. We have formed an interstate and Federal compact with those three States plus the District of Columbia and EPA, and we meet now regularly to try to devise a coordinated strategy to deal with the problems of—it's not just nonpoint source, but that is certainly a big problem with the Susquehanna—and what the ultimate outcome of our efforts will be, I don't know. What we're trying to do is get better control over those discharges of nutrients from nonpoint sources so as to alleviate the burden on the bay.

Mr. **Walker**. Well, I just hope there will be some sensitivity to the fact that you're dealing with the single richest agricultural, nonirrigated area in the world just north of there, and you're also dealing with an area where much of that agriculture is based on very traditional kinds of farming practices by Amish and Mennonite farmers who have been there practicing their craft for about 300 years, and I would hate to think that some of the things that we have in mind are going to drive those people out of farming and are going to have an adverse economic impact on that part of Pennsylvania; certain things and certain kinds of regulatory practices, of course, will be totally unacceptable to the Amish in particular, who will not respond to Federal Government regulation very kindly and will pick up and move. And I would think that it is absolutely essential that there is some sensitivity to that as these programs are developed.

Mr. **Ruckelshaus**. Well, you needn't worry about that. I understand the—not just the Amish, the reaction of farmers in general to any sort of Federal regulatory program, even State regulatory programs for that matter, or even local governmental programs. It's not always all that positive. And a regulatory program, I don't think, will work unless we can convince the individual farmer it's in their own economic self interest to somehow change the practices on their farms so as to avoid the problems associated with runoff.

Mr. **Walker**. So what we are talking about is a program in which we will elicit cooperation from the farm community in working on the problems. We're not talking about something which is Chesapeake Bay centered which does not then involve some agricultural input along the way?

Mr. **Ruckelshaus**. I'm absolutely convinced, if we don't get the cooperation, if we don't get the enthusiastic support of the farmers, we're wasting our time. We're not going to make it. We could devise the most elaborate regulatory program known to man and we wouldn't have any impact. We've got to figure out how to get people to think differently about how they have managed that farm to date, and it's got to be in their self interest to do so or they won't act.

Mr. **Walker**. Thank you, Mr. Chairman.

The **Chairman**. Thank you.

Mr. Gore?

Mr. **Gore**. Thank you, Mr. Chairman.

Mr. Ruckelshaus, let me add my welcome to those you've already heard, and my congratulations to those that have been heaped on you already for your work at EPA. It really is very important to the country to have you there and the fact that you have made such progress is a source of great comfort to many of us that were extremely concerned during the first several years of this administration. We still have some residual concerns, of course, but the fact that you are there and doing the job that you are is something that I feel pretty good about.

There are a lot of questions that I would like to ask you, but time is limited. I've spent a lot of time on hazardous waste disposal; I will just simply echo the concerns that were expressed earlier by Mr. Glickman, the emerging truth about land disposal of chemical waste is something that we have to quickly adapt to. Everywhere you look in the country, citizens' groups have organized to fight against this or that proposal to have a landfill disposal site or force a cleanup of an existing site. They're all finding the scientific truth, that they all leak, and they're looking to the Federal Government for alternatives and I think we've got to respond more effectively.

Let me focus my questions in the short time that we have here on another area, the area of genetic engineering and specifically the intentional release of new organisms created through genetic engineering. You know, there's a second wave of concern in the country now about genetic engineering. The first wave of concern was when the work was being done in the laboratory. We now know that concern was overblown; they were worried that some kind of chemical kudzu might escape from the laboratories and spread across the landscape. We now know those concerns could be relatively easily dealt with by safeguards in the laboratories.

Now, however, the industry has reached a stage where newly engineered organisms are being intentionally released into the environment. Many of these organisms will have tremendous commercial benefits and will improve our lives in many ways. Also, the likelihood that these newly released organisms will have detrimental effects, like chemical kudzu or like proverbial gypsy moths, is probably fairly small in each individual case. However, the damage which would be done if an uncontrolled spread took place is quite large and we know from our experience with larger organisms such as those that I've mentioned which were intentionally released—and there are many other examples, the starling, for example—was intentionally released by some screwball who wanted America to have every bird mentioned in Shakespeare, and if we could wring that person's neck now we'd be tempted to do so—there is now a traffic jam developing in the industry. The industry is being extremely responsible and civic minded in insisting upon careful review of every release that is proposed. But the Government is lagging behind and there is now no lead agency that is capable of stepping forward and saying yes, we'll be the traffic copy, we will respond to the industry's request for an imprimatur or seal of approval that this is O.K.; we'll help you evaluate it; we'll try to protect against the damage which, if it occurs, could stop this industry dead in its tracks in addition to causing environmental damage.

I chair a subcommittee here, the Investigations and Oversight Subcommittee, and we recently issued a report on controlled releases into the environment of genetically engineered organisms; we supported EPA's assertion of jurisdiction under the Toxic Substances Control Act to look at these commercial releases of newly engineered organisms. But I'm very concerned about the pace at which EPA is moving in this area, and I want to ask you specifically whether you foresee EPA developing a sufficient capacity to make timely decisions so as not to impede commercialization, and at the same time to protect the public health and safety. And if you could respond in terms of the increases in the ORD research budget and tell me specifically how much will be directed in dollars and personnel to genetic engineering risk assessment, I would appreciate it.

Mr. RUCKELSHAUS. Mr. Gore, I know you have had hearings on this subject and while I haven't read the entire report, I have certainly read summaries of it.

I share your concern that we have an emerging industry here that offers great potential for the future, that our country probably is in front of most countries now in responding to this problem; and if the Government intervenes in the wrong way, we could risk either destroying the industry or moving it offshore, which is more likely, or we could risk enormous adverse health and environmental effects to the public because we hadn't paid enough attention to what we were doing.

The very group that I mentioned in my statement, where we were looking at things like risk assessment, coordinating risk assessment, is also looking at biotechnology and determining whether or not we have a coordinated program across the Government. We don't. You're right, we don't have such a program, and it was partially in response to your hearings that we took this issue up in this interagency risk management group. There are, I think, as you suggest, very broad policy issues that ought to be addressed; namely, what is the role of Government in this and how can the Government be most helpful to these industries so that they can progress and at the same time make sure that we are protecting public health or protecting the environment? How should Government do this? EPA doesn't act—if EPA doesn't act responsibly, both in terms of our responsibility to protect public health and try to move these products out, assuming they ask us for some permission to do so and we have the authority to do so, then we could stifle this industry or do all kinds of bad things that we wouldn't want to do.

Mr. GORE. If I could follow up just briefly, Mr. Chairman. I know my time has expired.

I sent you a letter a couple of days ago, which I'm sure you haven't gotten yet, but if you could take a look at that and respond in some detail about this, I would appreciate it very much. I don't think this is an example of where the major concern is of Government inadvertently stifling the industry. Of course, that is a concern and it is a concern that I share. But I would put a little more emphasis on another aspect of the issue. You see, the industry really is looking for some guidance in how to determine which of these releases poses a greater risk than others. There is a general consensus within the scientific community and within the industry that we must select a lead agency in the Government, and that that agency must be invested with the capacity in people and dollars to make sensible judgments.

Where it stands now is, the consensus has developed, but there is a logjam of some kind in this interagency group that has delayed the selection of lead responsibility or the designation of lead responsibility. And all I'm saying is that the pressure that's building up, the number of proposals that are coming down the pike is so great that it justifies your personal attention in trying to unstick that logjam and putting that capacity in place for the sake of the public's protection and also for the sake of this infant industry which, after all, could be a major global business opportunity in the latter part of this century if we handle it wisely.

Thank you, Mr. Chairman.

Mr. FUQUA. Mr. Ruckelshaus says he'll answer your letter promptly.

Mr. RUCKELSHAUS. Yes. Yes, that's right, I will.

Mr. FUQUA. Mr. Gregg?

Mr. GREGG. Thank you, Mr. Chairman.

You mentioned in your opening statement the National Trends Network. Does that include the High Mountain Research Activity?

Mr. RUCKELSHAUS. I'm not sure I understand. That's a monitoring network that is being put in place.

Mr. GREGG. Right. And there are a number of mountain locations that you are thinking of?

Mr. RUCKELSHAUS. That's right.

Mr. GREGG. So that includes that?

Mr. RUCKELSHAUS. I'm not sure—I'd be glad to give you the whole network; you could see where all these stations are.

Mr. GREGG. Is that going forward?

Mr. RUCKELSHAUS. Yes.

Mr. GREGG. I had heard that OMB was resisting its implementation or trying to delay it.

Mr. RUCKELSHAUS. The National Trends Network?

Mr. EREGG. Right.

Mr. RUCKELSHAUS. Not that I know of.

Mr. GREGG. How about the mountain jesearch facility?

Mr. RUCKELSHAUS. Which facility are you—do you know—perhaps Dr. Riordan can answer that. He is in charge of our acid rain research program.

Dr. RIORDAN. The fiscal year 1985 research program contains one development and demonstration mountain cloud chemistry monitoring site.

Mr. GREGG. Is that Mount Washington?

Dr. RIORDAN. No, it would likely be White Face Mountain in New York.

Mr. GREGG. Are there any other sites planned for that?

Dr. RIORDAN. Yes. One of the reasons we didn't go more aggressively on the program is there's a concern about the methodologies that we would be using to measure deposition and characterize the fogs in the areas, and so we decided to go slowly. That was one of the discussions that took place on the Deutsch Committee. We had earlier thought that a more aggressive program was reasonable, but as we reviewed it with the Deutsch Committee we decided to take a more deliberate approach on that.

Mr. GREGG. So you're not planning to pursue the Mt. Washington facility?

Dr. RIORDAN. I suspect that we would propose to look at that during the planning for the 86 program; in fact, I'm sure we will.

Mr. GREGG. Thank you.

Mr. RUCKELSHAUS. That may be what you're referring to. The Deutsch Committee report is the basis on which this budget is submitted, and there were some submissions earlier to OMB before the Deutsch Committee came in which had additional research projects in there that they took out as a result of consultations with the Deutsch Committee.

Mr. GREGG. There are a number of landfills in my District, and I am sure all over the country, that have been directed by EPA to do something else; have you folks come up with a something else? There has not been one that's been proposed to these folks, but they keep being told to shut down their landfills.

Mr. RUCKELSHAUS. Well, I'd have to look at the specific landfill in question and see what alternatives are available. There are alternatives to landfills.

Mr. GREGG. I'm talking about rural community landfills where you don't have the availability of incineration, you don't have populations like towns and cities that meet incineration requirements.

Mr. RUCKELSHAUS. Well, I would really have to look at the specific case that you're referring to to determine whether there were alternatives and exactly what the basis for the EPA request was. Is it an administrative order, or——

Mr. **Gregg**. Yes; I'm not sure it's at the order level yet, but it's an administrative—they've been directed, been given a timeframe in which to close the landfills and they have no alternative sites, no alternative proposals. I was just wondering if you folks had come up with some in the area of rural disposal of municipal waste? Have you come up with some other alternative than landfills?

Mr. **Ruckelshaus**. Well, there are alternatives. Whether it's feasible for this particular rural area or not, I just don't know.

Mr. **Gregg**. What are the alternatives that you're familiar with?

Mr. **Ruckelshaus**. Well, there's incineration; I mean, there are all kinds of alternatives that are used by some municipalities to landfills. There are problems with all of them; there's the whole question of disposal of solid waste. Not hazardous waste, but just solid waste; this is a very big problem with municipalities in this country. And landfills are still used.

I don't understand the issue there. The disposal of solid waste on land is still being done in a number of areas around the country. As has been discussed here, there is a lot of problem with hazardous waste being disposed of on land, and the pressure is to move hazardous waste off land.

Mr. **Boehlert**. Will the gentleman yield for a minute?

Mr. **Gregg**. Yes.

Mr. **Boehlert**. Are you doing anything with resource recovery?

Mr. **Ruckelshaus**. Well, a lot is being done.

Mr. **Boehlert**. Is there any financing for resource recovery projects? Is there any Federal financing that you are aware of?

Mr. **Ruckelshaus**. There have been a number of resource recovery projects demonstrated around the country. I don't think we're in that right now.

Mr. **Boehlert**. Not in terms of research and development. How about any financing available?

Mr. **Ruckelshaus**. Not from EPA. I mean, there are municipal bonds and revenue bonds of a variety of kinds that make financing more attractive for those kinds of facilities, but not from us.

Mr. **Fuqua**. Mrs. Schneider?

Mrs. **Schneider**. I'm very frustrated in that I want to take some time to welcome you, Mr. Ruckelshaus, and commend you on the great job that you're doing, but I also have about 14 questions that I need to ask in very little time. So let me say a warm welcome to you, and I think I'll begin where we left off, with the whole issue of waste disposal.

I happen to serve on another committee which deals with some of the waste we're concerned with dealing with. There doesn't seem to be a comprehensive effort to really identify how we can dispose of the plethora of varieties of waste, whether it be sewage sludge, hazardous waste, municipal waste, or whatever. I would like to ask a specific question about a project at the Franklin Institute. EPA had funded the Franklin Institute some years ago for the disposal—to develop the technology to dispose of sewage sludge. The final product was referred to as Eco-rock; it has been used as a road surface material for the last 6 years. They have experienced no potholes, no cracks, no nothing, and to me it seems like the ideal way that we can take a problem and turn it into a positive effort. I don't know if you're familiar with this project; I don't expect you to be, but if someone from your staff could update me as to whether or not EPA has any interest in pushing for this type of technology development, either through tax incentives or through extended research dollars or whatever, I'd be most interested.

Mr. RUCKELSHAUS. Fine. We'd be glad to do that.

[The material referred to follows:]

EPA will actively promote those municipal sludge management practices that provide for the beneficial use of sludge while maintaining or improving environmental quality and protecting public health. The Agency is preparing a policy statement on this subject. The Agency believes that beneficial sludge use should be the intent of major sludge management technologies of the future, and has in fact supported research on this subject, including support of research on Eco-rock in the past. However, we cannot promote a particular product; nor do we suggest specific technologies for particular municipalities. Our support takes the form of regulatory attention and introducing those technologies in our workshops and other forums.

Mrs. SCHNEIDER. The other area of disposal of waste, waste energy projects, the Department of Energy has essentially cut all of the funding for the technology of turning waste to energy which, to my point of view, is lamentable and I hope that if you're ever asked your opinion, you would emphasize the fact that we have more waste than we know what to do with and we need some direction by the Federal Government because we're not getting it from the public sector, which now leads me to another element of waste, and that is hazardous waste.

I know that you are familiar with the current proposals and my bill to provide for a waste end fee to the Superfund reauthorization; and we had a very interesting debate in yet another committee that I served on the other day, asking the question, "Does policy determine what technology will come to the forefront, or does technology determine what policy we will develop?" And you are finding throughout the country, different States saying, "Thou shalt not dispose of any waste material in the land." We are not providing the alternatives. The argument is, well, by the industry, they say that 70 percent of all hazardous waste can be recycled. There is not that demand. So we are running into a problem of supply and demand and also leadership. Industry will not lead unless they know that there is a market, unless they know that their products will be in demand.

Are you supportive of the waste end-fee concept and to what degree are you going to be involved in either its pursuit or defeat?

Mr. RUCKELSHAUS. I am going to testify tomorrow on the Superfund in front of Congressman Florio's committee in which I'll be discussing this along with a lot of other features of his recommendations.

We are probably doing more work than anybody on the waste end tax, EPA is, to try to understand exactly how such a tax might work. We are working with the Treasury Department, who is going to be the key in the development of any kind of tax of that kind, both from the standpoint of how much money would you raise; and second, what kind of an incentive would it be to reduce hazardous waste? It obviously would be an incentive. Now, is that the best kind of incentive we could develop? And is the tax what we ought to use, either as an incentive or as a disincentive, to provide less waste? Obviously the less waste we have to treat or handle, the better off we are.

And you mentioned supply and demand. The more successful we are at reducing the amount of waste, the more excess capacity the hazardous waste treatment industry claims they have available, the less there will be demand for it. And what we are currently doing, through a combination of policy and technology, is driving more and more hazardous waste to be treated on the site of the generator of the waste itself, and less and less transferred off. Some of that has to do with liability; some of it has to do with cost, and a whole lot of factors. All of that has to be thought clear through, it seems to me, in the reauthorization process of Superfund.

Mrs. SCHNEIDER. Let me just share with you one example, Rhode Island being the Nation's largest manufacturer of costume jewelry. We have a number of small family businesses, and recognizing that our economy is built upon small businesses, it's interesting to note that a number of these small jewelry firms who live in the neighborhood that they are potentially polluting have decided on their own that despite that it costs so very, very much money to get this new technology to clean up their waste, they don't want to have to experience the costs that will come later on in terms of cleanup or in terms of their health that they might be jeopardizing, either their employees or their own families that live in the general vicinity.

So there is that desire there, but so often they say to me, "Can't we get a tax break, or isn't there something that we can do for doing the right thing?" It would be nice if everyone did the right thing because it was the good thing to do; but the majority does not, unfortunately.

Mr. Chairman, is there any more time remaining?

Well, I'll just ask another, hopefully quick, question. Indoor air—the 85 EPA R&D authorization bill addressed the need for research on indoor air quality and authorized $4 million for the program in 1984 and 1985. However, the administration's 1985 budget requested no funds for indoor air studies. Yesterday we had a hearing with the Department of Energy; they essentially have zeroed out funds for indoor air also. Everybody seems to acknowledge it as one of these long-term problems that needs research attention.

I'd like to know if EPA did request funding from OMB for indoor air pollution for 85 and, if so, did OMB eliminate that funding? Were they the ones who chose to eliminate your request?

Mr. RUCKELSHAUS. Yes. Yes.

Mrs. SCHNEIDER. OK. What kind of justification or reasoning did they provide you with for elimination of that fund?

Mr. RUCKELSHAUS. Based on the appropriation that was made last year by the Congress, there has been ongoing discussion between the Agency, between OMB, and the Congress, with OMB feeling that there is no current regulatory responsibility to deal with indoor air pollution and therefore the Agency's research into this area is not consistent with any regulatory mandate.

We do have, this year, a series of ongoing studies on indoor air pollution that will actually carry into 1985. I'll be glad to give you that entire breakdown of what it is we're doing. And we're back into this bigger issue of how much money are we going to allocate for what kinds of problems in this country, given the sort of demands on the budget that there are, and that people are going to differ on what that ought to be; and basically, if I go back to where we were in this research budget when I started, and where we are now, we're 34 percent higher now than we were in May when I came back here, in this fiscal year 1985 budget. The fact that we don't get everything we request in a budget year like this is not surprising to me.

[The material referred to follows:]

Indoor Air Quality

QUESTION:

The Congress appropriated to EPA $2 million for indoor air quality research in FY 1984. What are EPA's activities in this area?

ANSWER:

We have undertaken two related efforts: (1) a research program designed to improve our understanding of the problems to public health posed by indoor air pollution and (2) a leading role in linking the several agencies with an interest in indoor air quality. Our research program consists of a few key parts: (1) the development -- with the Department of Energy (DOE) and the Department of Health and Human Services (DHHS) -- of a design and protocol for a national field survey of indoor air quality and of health impacts related to indoor exposures (about $600K), (2) the improvement and validation of techniques to measure indoor air pollution in homes and other buildings (about $475K), (3) the identification of the key sources of indoor air pollutants, such as unvented combustion devices and building materials ($500K), and (4) a focus on radon, including the testing and evaluation of low-cost methods to mitigate radon indoors (about $425K). The interagency Committee on Indoor Air Quality, with EPA, DOE, DHHS, and the Consumer Product Safety Commission as co-chairing agencies, has begun the difficult process of identifying current research and action efforts. The first meeting was held just before Christmas and work is continuing; a second meeting is scheduled for late May.

Mrs. **Schneider**. Mr. Ruckelshaus, it comes to my attention that the EPA research is operating at 75 percent of its 1974 resource level once it's been corrected for inflation, and since 1980 the cut for ORD has been 47 percent; yet the workload, it's my understanding, has doubled. And I've looked at the legislation that's passed dealing with environmental regulation since that time period, and there are eight major pieces of legislation. It seems to me—I recognize you have to deal with a limited budget, but when you look at the national polls and you look at the immensity of the problems and the enormous dollars that might be required to address some of those problems in the long term if we don't invest the dollars in research now, I can only anticipate that we are going to be whopped up side the head with the biggest environmental cleanup budget one can possibly imagine and the biggest health budget. And here, the biggest issue of the 1980's is medicaid/medicare and higher health costs. Of course, there are various reasons for that, but we have to understand that we are no longer in those days of saying, yes, I'm an environmentalist because we don't want to cut down trees or we don't want a new highway. There are environmentalists now who understand that the reason we are doing research at EPA is because we are drawing the link between environmental pollutants and human health. That link is becoming increasingly more critical.

My time is up. You can say whatever you want.

Mr. **Ruckelshaus**. Yes. Let me say a couple of things about trying to compare today's research budget with the research budget of several years ago. It's a little bit like apples and oranges. A lot of this budgetary cutback has occurred in energy-related research; some $58 million out of the budget came from synfuels and other energy-related research. There is a large piece, about $40 million, associated with effluent guidelines and wastewater research.

The President's budget when I returned last May was $206 million for research. This current request is $278 million, up from $245 million, which we increased it to in June of last year. That's a 34-percent increase. Now, if you are to say, could we justify more expenditures, sure. We requested more. But I am not the ultimate allocator of all this; the President is. He's got to make a judgment as to how the tax revenues—or even the tax revenues plus borrowing—is going to be allocated among all of these domestic programs. I think, under the circumstances that we face in this year, that we've done very well. Now, you can go back and look in the past and say, you've done well against the base that's been cut back appreciably; but I wasn't here when that base was cut back. They obviously had some justification for doing that, it wasn't just done willy-nilly, and there has been, I think, a response to my request that we need to bring this research budget back up and meet the needs of the Agency. I think, given all the factors involved, a 34-percent increase since May is an appreciable increase.

Mrs. **Schneider**. Mr. Chairman, I would like to have unanimous consent to submit for the record, and also to submit to Mr. Ruckelshaus, a study that's been done by the American Environmental Safety Council which has some varied opinions on the budget for ORD and perhaps we could have some response to the issues raised there so we can better draft our budget, ultimately.

Mr. Fuqua. You are asking unanimous consent to submit additional questions in writing for answers in 10 or 12 days, in order to get responses from Mr. Ruckelshaus?

Mrs. Schneider. Yes, sir.

Mr. Fuqua. There being no objection, so ordered.

Your original 5 minutes has almost expired.

O.K. Congressman Volkmer.

Mr. Volkmer. I appreciate it; I have one additional question that I didn't address.

On page 14 of your testimony you discuss the Limestone Injection Multistage Burners Program, LIMB. However, in examining the budget, I find that there's been a decrease of about $300,000 for fiscal year 1985; is that correct?

Mr. Ruckelshaus. Yes; the essential budget is $10 million for the next 2 years, this year and next. There is a $200,000 decrease. It doesn't have anything to do with the commitment to move that program as fast as we can; it's just the stage at which it is in 1985. It came out that we needed $200,000 less on a $10 million base.

Mr. Volkmer. In other words, it will decrease again next year?

Mr. Ruckelshaus. No, not necessarily. I don't know what we're going to request in 1986; it depends on what stage it's in. We're pushing it through the pilot bed stage into a demonstration stage as fast as we can.

Mr. Volkmer. You're not looking, then, to such things as funding from any other source, DOE or from— or expecting to catch up the rest from private industry, or anything like that?

Mr. Ruckelshaus. Well, the demonstration project will be cofunded by industry, but that isn't——

Mr. Volkmer. Part of the reduction?

Mr. Ruckelshaus. No; that will be a big contribution by industry, when we actually put it into the demonstration stage.

Mr. Volkmer. What you're telling me then is that the amount of money that you have in the budget is all that you really need?

Mr. Ruckelshaus. That's right.

Mr. Volkmer. OK. Thank you.

Mr. Fuqua. Congressman Bill Nelson of Florida?

Mr. Nelson. Good morning.

I think you all have already touched on EDB, but I would like, since I'm from Florida, to ask you a couple of things with regard to EDB and citrus, fresh citrus.

First of all, you have banned the domestic use and yet have permitted the use of EDB, particularly with regard to insects, as a means of controlling the insects on our foreign shipments. Do you have any response from countries such as Japan that we ship a tremendous amount of fresh grapefruit to, from Florida? Whether or not as a result of it being banned in our domestic use, they are going to back off of the receipt of fresh grapefruit from Florida that has been treated with EDB.

Mr. Ruckelshaus. No, we do not. I have talked to the Japanese about it, both here and in Tokyo, and we indicated to them—it didn't seem to me that it was up to me to make a judgment to them as to what standards they ought to set on pesticides or whatever for the import of fruit. They use EDB on the importation of fruit from their own southern islands, in addition to, from Malaysia. And our indication to them was we will try to make sure that whatever your requirements are for the importation of fruit, we will meet them. Now, if we find that in our judgment the use of certain substances presents such a hazard that we don't even want to do it in terms of fumigation techniques, then that's our judgment to make. But we're not trying to make a judgment for you, and I encouraged them to—I shared with them all the information we had and said, it's your judgment to make, not mine, as to what standards you want to set for the protection of your own people. And then we have to meet those standards.

Mr. NELSON. Well, I think that's good. What is the scientific data that you are developing as you make a judgment of whether you ought to have an outright ban on EDB in the fumigation of the fruit going to such countries as Japan?

Mr. RUCKELSHAUS. That side of the data is all in voluminous packages contained in the public documents that were filed with the decision in September to ban it as a soil fumigant, the decision in early February to ban it as a grain and spot-milling fumigant, and finally, to phase it out. We are setting a tolerance between now and the first of September on the use on citrus, and the scientific data has to do with its potency as an animal carcinogen; that information extrapolated to man, some assumptions about the amount of citrus in the diet of man—what that risk therefore amounts to over the course of the lifetime of man, and we then come up with a risk number which usually is a fairly conservative outerbound kind of number. If you extrapolate that down to the exposure over a relatively brief period of time, we don't think it's that much of a problem. That's why we felt that setting the tolerance and phasing it out as of the first of September made the most sense, both from the standpoint of protecting public health and minimizing the impact on citrus growers or others.

Mr. NELSON. So as of September 1 of this year, it will be phased out, the use in the control of the Mediterranean Fruit Fly, which is the threat to Japan? It will be totally phased out?

Mr. RUCKELSHAUS. The use of EDB will be phased out.

Mr. NELSON. That's right. OK. Then what is the research that you're doing now——

Mr. RUCKELSHAUS. Excuse me, just a minute. It will not be phased out in its use on export to Japan. That's up to the Japanese to decide that. But we're not permitting it to be used domestically, where it's not being used now anyway, domestically, or as an import, primarily from the Caribbean.

Mr. NELSON. You're saying as of September 1, you're phasing out—what as of September 1?

Mr. RUCKELSHAUS. Phasing out any domestic use or use on imported fruit, fruit imported into this country.

Mr. NELSON. OK. Now, with regard to making that phaseout and that final determination, what are you doing now in the way of research to find an alternative that would be acceptable for EDB?

Mr. RUCKELSHAUS. There are alternatives available now; those alternatives are registered pesticides, such as methylbromide. There is cold treatment that is available for the shipment of—there have been shipments from Florida to Japan using cold treatment—we have been working with the industry; we in fact are convening a conference here, I think it's next month, with the citrus growers from the Caribbean, in addition to the domestic growers, to discuss the whole question of alternatives and how they can be made available.

Mr. NELSON. Now, is one of those alternatives irradiation?

Mr. RUCKELSHAUS. Irradiation has been approved on a preliminary basis by the Food & Drug Administration and is available, and may well be the answer. It takes time to phase in those kinds of facilities to irradiate fruit.

Mr. NELSON. Mr. Chairman, thank you.

Mr. SCHEUER. Mr. Ruckelshaus, let me avert to the whole business of ocean disposal of solid waste and the whole comparative business of knowing which is the least environmentally degrading method of disposing of sludge, whether by land, or by sea, or by air.

Several times this committee has passed legislation mandating EPA to join with NOAA, I believe, in conducting cross-media comparisons of the relative costs, the comparable costs, of disposing by land, by incineration, and by ocean dumping. Unfortunately none of these efforts has seen the light of day as legislation due to various events, among them a Presidential veto. But the spirit of this committee is clear. We'd like a comprehensive look at what is the least environmentally degrading form of disposing of sludge. As you recall, a Federal district court judge, Abraham Sofaer, more or less mandated the same thing in a decision he made on the question of disposing of sludge in New York City several years ago.

New York City dumps a little over 3 million tons of treated sewage sludge in the bight, the 12-mile bight. It comes to us, or the gossip is, that EPA is going to require that sludge to be dumped not at the 12-mile limit, but at the 106-mile limit. Are you familiar with that? Can you give us some guidance as to whether that——

Mr. RUCKELSHAUS. Yes. That decision, the decision responding to Judge Sofaer's opinion was delegated before I arrived to the Assistant Administrator for Water. He has been working hard on that; in fact, he testified here in Congress a week or so ago on that issue, and it is his plan to have that decision out by the end of this month. And the judge asked him to look at the alternatives of the 12-mile site, which included also the 106-mile site and any on-land site they have. The decision will both include, as I understand it, regulations which are required and some discussion of the alternatives. I don't want to anticipate what Mr. Ravan's decision is, nor do I think it's appropriate for me at this point to revoke that delegation. He is pursuing it diligently. I was with him when we testified before an appropriations committee the other day and he indicated the end of the month was his deadline, when he would have that decision—the end of this month.

Mr. SCHEUER. Is this the right forum for us to be discussing this judgemental call?

Mr. RUCKELSHAUS. Well, I don't know whether it is or not. I'm perfectly glad to respond.

Mr. SCHEUER. OK. Having given me that go-ahead signal, let me express a view and you can pass it on. I hope he does the Lord's work and comes down with the right decision—as I view it, of course. [General laughter.]

Mr. RUCKELSHAUS. Whatever the Lord wants.

Mr. **Scheuer**. Going from the 12-mile limit to the 106-mile limit is going to cost New York City $25 million or $30 million a year. Now, the question is, is that $25 million or $30 million a year a reasonable requirement, and are we buying something for the environment that is of considerable value? It's impossible to fine tune whether it's worth $10 million or $30 million, but is it of very considerable value? There are scientists who say—I think the burden of scientific opinion is that, at present, the bight is so degraded that the dumping of sludge only adds about 5 percent to the pollution at the 12-mile limit. But at the 106-mile limit you've got a pure and pristine situation. If you start dumping there, you're going to degrade something that isn't presently degraded, and you're going to degrade something where, because it's very much deeper and there all kinds of currents in play there, the business of monitoring it and testing it is infinitely more complicated and expensive. Infinitely more difficult to track the transport than it is at the 12-mile site. I've become an expert on the intricacies of transport from my elementary education in acid rain, and every time the scientists are talking about the problems of transport and explain what the problems are, my eyes glaze over; I mean, it's so incredibly complicated it boggles the mind. But that's what you're getting into, trying to track the pollution and the transport problems at the 106-mile location, which is pure and pristine now.

It seems to me almost an open-and-shut case. You're making an infinitesimal contribution to what is virtually an open sewer, that is easily detectable and easily monitored. I don't know how easily treated; I hope it will be easily treated when we get to the point of doing something at the 12-mile site.

It seems to me that, forgetting the extra $25 million to $30 million to New York City a year, the cost of going to the 106-mile site, it would be a question of fools rushing in where angels fear to tread, to start degrading what is now undegraded, pure, pristine, as God made it and as God would have it.

Those are some gratuitous remarks and you can react or you can not react, as you see fit.

Mr. **Ruckelshaus**. Well, I'll certainly pass those on to Mr. Ravan and tell him what the Lord said. [General laughter.]

I am absolutely certain that whatever way he decides that issue, he'll get landed on because there are people with very strong views on both sides of it. It's my understanding, from Mayor Koch, that it's a $20 million bill to New York.

Mr. **Scheuer**. How much?

Mr. **Ruckelshaus**. $20 million, and about——

Mr. **Scheuer**. Well, it's what the Lord said, plus $20 million. [General laughter.]

Mr. **Ruckelshaus**. It's something like 5 percent to 11 percent of the problem, and it doesn't appear to be causing problems on the beach.

Mr. **Scheuer**. Well, I think to be very fair about it, there are reputable, credible Members of Congress for whom I have high regard, representing the State of Delaware, if I'm not mistaken, and New Jersey, who are very much concerned about what's going to happen on the beach if we continue——

Mr. RUCKELSHAUS. Well, you're talking about the 106-mile or the 12-mile?

Mr. SCHEUER. The 12-mile, yes.

Mr. RUCKELSHAUS. They're worried about both of them.

Mr. SCHEUER. I think they favor going to the 106, regardless, as we say in the Eighth District of New York, of the $20 million or $25 million or $30 million.

Mr. RUCKELSHAUS. It's basically the New Jersey Congressmen who are in favor of going to 106 miles; the Congressmen and Senators from Delaware and Maryland wanted to leave it at the 12 mile. It has something to do with where they live, I think.

Mr. SCHEUER. Well, I guess it depends on whose ox is being gored, whether the ox is an expert on all the intricacies of transport, which totally baffle me.

Congressman Buddy MacKay?

Mr. MACKAY. I can't approach the spiritual level of that dialog. I've had some experience at the State and local government level with RCRA and hazardous waste, and it strikes me that you have there a situation where you are at the state of the art in a different sense; not the technical sense, but the governmental sense. You have responsibility for a program, the organic statute, which is not sensitive to intergovernmental relations. I think everybody involved would agree that's a problem.

You've got now, with the elimination of the small generator exemption, or the gradual phaseout, you've got an issue that brings that to a head. It seems to me you've got a chance to do some research in the whole question of, how does a Federal regulatory agency which can't really bring about the results on its own that the statute mandates, how does it perform a role? In other words, in a good sense of the word, a New Federalism? How do we get the result which we know has got to be brought about primarily at the local government levels? State government's got the same problem. They can mandate local government all they please; and if local government doesn't choose to abide by the mandate, nothing happens.

Do you see that as an appropriate area for your research dollars, say for instance, funding pilot projects and trying to help State governments perhaps educate and train local governments and the local business institutions like chambers of commerce and business groups on what their responsibilities are?

Mr. RUCKELSHAUS. Well, I think that's a very good suggestion, and I think you correctly stated the nature of the challenge to us; namely, how to delegate this program down to the States and make it work.

It's a very complicated program. When I was here before, we were at a similar stage with the air and water programs. They were in the process of being delegated, and I went around the country and talked to the State water and air pollution control officials. Coming back here, I took a similar tour and talked to the solid waste and hazardous waste people from the States. I could close my eyes and hear exactly the same complaints, exactly the same charges about what the Federal Government was doing and not doing. And we have, I think, in Lee Thomas, who is the Assistant Administrator in charge of that program, a very sensitive Government manager. He comes from State government experience himself, and he is trying very hard to affect this delegation in a way that doesn't slow down the momentum of the program and at the same time solve the problems, as you suggested, that are in the statute that we can't solve ourselves. Now, whether we should do this through—I think probably R&D, as we are describing it here, is not the proper place to——

Mr. MacKay. That's really the question I'm asking. Do you see yourself in a supportive role, where you could support research that's got to be done at a different level of government? In other words, instead of mandating and trying to force from the top down, in essence using your resources in a way that could bring about results through incentives?

Mr. Ruckelshaus. Yes. That is exactly what our research program is trying to do in the hazardous waste disposal area, is to pick up what won't be done either by the States or local government or by the private sector, focus our attention on that, and then try to transfer it where we have some successes, down at the local level.

Mr. MacKay. If I've got another minute, I would just like to say one thing in a positive way.

I agree that it's very important that you have achieved this dramatic increase in your research budget. However, in some areas, one particularly being alternatives to solid waste landfill, I have to say that going from $3.2 million to $5.1 million doesn't really address that problem. The real question that I would hope you would do, and I would like to be one who would assure you of support in this, would be to back off and look at that problem as we now understand it with the intensity it's going to have, like the acid rain thing, and decide what kind of effort it's going to take. And it may be that it's in the magnitude of tenfold that; and if so, I think we ought to be honest enough to face that. I just want to say, if you reach that conclusion I think there is strong support. I come from Florida; we have the classic double bind, where people are being mandated to dispose of materials that they can't put in the local county solid waste dumps; there are no certificated places to put it, and we've got deadlines and you can just see a classic confrontation being set up. It's a shame when you see it coming, that somebody's not doing more than we're doing.

Mr. Ruckelshaus. I couldn't agree with you more, and it's not just the availability of techniques and systems that work; it's also getting them sited.

Mr. MacKay. I agree, but part of that is in educating the public; and part of that is getting a better handle on what can be done safely.

Mr. Ruckelshaus. I think that's right.

Mr. MacKay. Well, that was an editorial, not a question.

Mr. Ruckelshaus. Well, I think it's good advice.

Mr. Scheuer. Mr. Ruckelshaus, Mr. Administrator, it's been a pleasure having you here. We thank you for your patience. I may say in passing that this is the first time in 3 years that we haven't had to threaten the issuance of a subpoena to get the Administrator down here. It's a great pleasure to have you respond to a simple letter or a simple phone call, and that simply symbolizes the vast improvement in the quality of the relationship between you and the Congress, the vast change that has taken place in our view, in the quality of the morale, the professionalism, the integrity of the Agency, and we have to give you the credit for having done a remarkable job in turning it around. Now, we're waiting for some forward motion.

Mr. RUCKELSHAUS. Thank you very much, Mr. Chairman.

[Whereupon, at 12:15 p.m., the committee recessed, to reconvene at the call of the Chair.]

APPENDIX

QUESTIONS AND ANSWERS FOR THE RECORD

RESEARCH BUDGET AND MANAGEMENT

1. INDUSTRY/ENVIRONMENTAL GROUP CONCERN

Mr. Ruckelshaus, we have heard that an ad hoc group of environmentalists and industry representatives have been meeting recently in an effort to organize support for increases in EPA's R&D budget.

A. Have you heard of, or had any opportunity to participate in, such discussions?

In January, 1984 I was informed that a group of individuals representing several chemical industries and public interest organizations have cooperatively agreed to seek support for EPA's research and development budget. Members of this group requested and received historical information which is publically available on R&D budgets from my staff. The group's decision to take action and the actions taken did not involve participation by me or my staff.

B. Do you detect a wish by industry for a change in the EPA R&D budget? What dollar amounts? In which areas would industry prefer to see increased research, and in which areas decreased research? Please also give your impressions of the preferences of the environmental groups for changes in EPA R&D activity. To what extent do the requirements of the two groups overalap?

Industry recognizes the impact that the shrinking dollar has had on EPA's efforts to have an effective R&D program and is deeply concerned that the Agency's budget has not kept pace with either the cost of conducting research or the increasing demands for scientific information. My understanding is that all individuals in the group seeking increases for EPA's R&D budget have asked for an additional $101 million in support of the Agency's 1985 budget. My understanding is that this amount is being suggested by both industry and the environmental groups for increasing the Agency's research on hazardous waste, indoor air pollution, exposure assessment, groundwater, risk assessment, extrapolation of animal data to man, for facilities upgrading, and for computerization of EPA's laboratories. My impression is that both groups agree that the Agency's R&D needs are underfunded. However, I have no knowledge of what research either group suggests be decreased, or the extent to which their requirements overlap.

C. If the major requests of industry and the environmental groups for R&D at EPA were met, would additional funds be required? If so, how much .... Would it be an extra $50M? 100M? $200M?

If the areas suggested in Part B of concern to industry and the environmental groups are to be met, then additional funds would be required. The suggested amount would be necessary for efforts to be undertaken in all of these areas.

D. If this committee were to recommend increased funding for EPA R&D work along the lines we've been discussing, would you have immediate uses for these increased funds? Please describe these uses and their importance.

EPA's research budget request is based on the highest priority research needs as identified by the program offices and the Office of Research and Development. ORD and the program offices, in identifying and establishing priorities for research needs, have also identified areas where expanded research would be desirable, but which must be deferred due to budget constraints. If additional funds became available these unfunded projects would be reviewed and considered for support. I would direct that this review take place only if there were a reasonable certainty that the funds would be made available; therefore, it is not possible to provide a list of specific projects which would be funded at this time.

2. SCIENCE ADVISORY BOARD

A. Q: Have you taken means to ensure that potential SAB members are not screened for their political views?

A: SAB members are selected on the basis of the scientific expertise they contribute to the review of issues brought before the SAB. The objective is to choose qualified candidates who can provide an independent perspective on the scientific basis of EPA decision making. There is positively no effort to screen prospective SAB nominees for political, religious, social or any other than legitimate views that concern their scientific qualifications and independence.

B. Q: Would you oppose a legislative requirement that the Board be impartial and independent?

A: Legislation designed to further protect and enhance the impartiality and independence of the SAB could have merit. Care would have be taken, however, to ensure that EPA, which is responsible and accountable for managing the SAB, retains the authority commensurate with this responsibility, i.e., such as the appointment of SAB members, selection of issues for SAB review, and reconciliation of SAB resource needs with those of the Agency.

C. Q: What role do you envision for the SAB and what steps are you taking to achieve a credible and qualified Board?

A: The role of the SAB has two important components: 1) to review the quality of research and research planning within EPA to enhance the Agency's capability for defining and obtaining information to support its mission; and 2) to carry out reviews of the scientific basis of proposed standards, regulations, criteria and limits to ensure that they are scientifically defensible.

The Agency has implemented and is in the process of implementing steps to increase the stature of the Board with respect to credibility and quality. These steps include: 1) new members have been appointed which has enabled the Board to represent a greater diversity of expertise and opinion within the scientific community; 2) numerous scientists and scientific organizations have been asked to provide their recommendations on qualified nominees for SAB membership; 3) plans are being developed to make the SAB nomination process more visible in order guard against any future abuses; 4) within the last six months the SAB has been asked to review scientific issues within every program office of the Agency; and 5) the SAB staff has been significantly expanded and upgraded through the addition of three new staff scientists.

3. Relation to Other Agencies Budgets

3.Question: The March 9, 1984 issue of "Science" contains an article entitled "Sleight of Hand with EPA's R&D Budget." It points out that EPA's R&D budget request for FY 1985 is 24% less than the FY 1981 budget. It also asserts that the President's proposed increase of $33 million from last year's level would be cancelled out by reductions in the environmental research budgets on NOAA and the U.S. Geological Survey.

A.What is your sense of the overall environmental R&D funding request for FY 1985 throughout the Federal agencies? Does OMB, EPA, or any other body attempt to develop a coordinated inter-agency request for environmental R&D? If so, how?

Answer: No summary of environmental research funding across the Federal government is available. However, the Special Analyses of the FY 1985 budget request provides information on resource trends for all Federal R&D (Part 3, Section K). The research resource totals for those agencies which carry out the bulk of environmentally related research are $6.7 billion in both FY 1984 and FY 1985 (Energy, Interior, Commerce, EPA, Agriculture).

There is no formal process for developing a coordinated interagency request for environmental research and development. EPA, through interagency agreements and informal agreements, does coordinate its research planning with other agencies in specific areas (e.g., ocean research is coordinated with NOAA). In addition, OMB is able to review the requests for environmental research across the Federal government to insure that the total proposed research program is consistent.

RELATION TO OTHER AGENCIES' BUDGETS

B. Question: What effect would the proposed termination of NOAA's Sea Grant program and other oceanic research have on the effectiveness of EPA's activities?

Answer: The proposed termination of these NOAA programs would most likely have little immediate impact on the effectiveness of EPA's activities. Although some of NOAA's programs are coordinated with EPA, to prevent duplication of effort, NOAA's studies are not designed to meet the regulatory needs of EPA. However, it should be noted that some of the information developed by NOAA provides a better understanding of selected situations or environmental processes. This can be useful to EPA at some future time.

RELATION TO OTHER AGENCIES' BUDGETS

C. Question: What effect would the proposed closure of NOAA's Great Lakes Research Laboratory have on the effectiveness of EPA activity in Great Lakes research?

Answer: The closure of NOAA's Great Lakes Research Laboratory would, in the short-term, have only minor effects on EPA's Great Lakes Research activity; however, in the long-term the effects would be substantial. This change in effect over time is attributed to the different kinds of research each facility conducts. NOAA's research is "basic" because it focuses on obtaining the basic physical, chemical, biological, and hydrological data on the Great Lakes. EPA's research is "applied" because it is mission oriented, focusing on a specific problem. The relationship between the two is that the EPA uses the information NOAA provides in its research program. If NOAA closes the facility, the information base will eventually become out-dated unless some other organization assumes this activity. The EPA believes it can assume this "basic" research activity without adversely affecting its applied research program.

RELATION TO OTHER AGENCIES' BUDGETS

D. Question: What is the rationale for reducing ocean dumping research throughout the Federal Government? (Proposed FY 1984 reduction was nearly 50%).

Answer: The government-wide reduction in ocean dumping research programs reflects the completion of major research activities. EPA's ocean dumping research program, which has been developed to meet the needs of its permiting responsibility has not sustained any resource reductions. This is because of a continuing need for problem-specific information.

4. Red Tape in Project Approval

Question: During the October, 1981 EPA R&D posture hearing before this Committee, it was established that internal proposals for ORD research work take 2.5 years to be approved.

A. What changes, if any, in organizational structure and procedure have been made to reduce this time? How long does the approval process take now?

B. What peer reviews are involved in the approval process? How have they changed, if at all, over the past 3 years?

The estimate of 2.5 years for the approval process for a research proposal was based on the fact that the time between beginning to plan for a fiscal year and the onset of the fiscal year is 18 months. For example, EPA will begin its budget process for FY 1986 in April/May of 1984; the FY 1986 operating year will begin in October 1985. To this was added an estimate of 12 months for the procurement process.

The time frame for the budget development process is still 18 months since this must follow Agency and Congressional schedules. However, we have made a major change in the ORD internal budget development process by consolidation of the fourteen Research Committees into five (Air, Energy, Water, Hazardous Waste/Superfund, and Toxics/Pesticides). These now involve high-level program office and ORD personnel and the laboratories are full participants on them. The consolidated committees are able to provide guidance on major research priorities and will review and coordinate the budget request in their areas. Laboratory participation will make it easier for researchers in the field to initiate proposals and to follow them through the budget process.

The 12 month estimate for procurements is clearly the extreme range for getting grants, cooperative agreements and contracts awarded. A more reasonable estimate would be six months after the beginning of a fiscal year. Once the budget request is sent to Congress it is possible for our researchers to begin detailed planning for awarding research, and, in some cases, for awards to be made soon after the onset of the fiscal year.

No pre-proposal peer reviews are required in the budget approval process. Budgets are reviewed by the Research Committee, ORD top management, EPA management, and OMB prior to submittal to Congress.

ORD follows the Agency process for grant and contract awards, which involves reviews of proposals for quality and cost. In addition, special procedures are followed for exploratory research grants, which are ranked in technical merit order by panels of outside scientific experts in the following fields: health research, biology/ecology, engineering, chemistry and physics/air, and chemistry and physics/water.

5. CREATIVE FUNDING & ORGANIZATION OF R&D

Question 5A: Under former EPA Administrator Douglas Costle, EPA and the Chief Executive Officers of the four automobile manufacturers jointly established the Health Effects Institute to study health effects of diesel fuel.

How successful, in your view, is this experiment in Agency-industry cooperation?

Answer: The experiment has been operating for 3 1/2 years. In this period, the Health Effects Institute (HEI) has established itself as a major health research organization, has attracted many leading health scientists throughout the country to conduct health research on motor vehicle pollutants, and has established a highly regarded Board and Committees. HEI is no longer an experiment; it is an organization recognized by its sponsors as the major mechanism through which the participating motor vehicle and engine manufacturers discharge their health testing responsibilities under Section 202(a)(4) of the CAA.

Question B: Do you support the idea of establishing other Agency-industry institutes? An Agency-chemical industry institute, for example, to examine the health effects of pesticides in food?

Answer: The concept of Agency-industry institutes to do health effects research on regulatory problems is now established. Certain key elements need to be present though to justify the marshalling of the exceptional talent needed to develop and operate such institutes. The institutes should be established only in those circumstances where the normal processes for obtaining credible health effects data have been tried and failed.

Question C: Have you considered siting Agency-industry institutes at university "Centers of Excellence"? Please comment on the advantages and disadvantages of such an arrangement.

Answer: The Agency-industry institute concept obtains its strength and influence by attracting the "Who's Who" from the scientific community. It awards research to the best proposers after soliciting the entire U.S. research community. Limiting the scope of the Board and Committees to a single university or limiting the researchers to a department or college of that university would dramatically alter the concept, leaving a much less effective entity.

The "Centers of Excellence" concept was established for the purpose of assembling a critical mass of experts at one location to address important environmental issues. It is a normal approach for performing research. Only when the problem area cannot be resolved through a normal approach would an HEI-mechanism be employed.

Question D: Would acid rain be a suitable issue, in your view, to be investigated at a joint Agency-industry-university center?

Answer: Certain aspects of the acid rain research program could be considered as a candidate for an HEI-like approach. We would like to evaluate, in depth, the benefits of an HEI-like approach in the acid rain area and revisit your question after that analysis. As we said in C, above, the university center is not applicable to the Agency-industry concept as embodied in the HEI model.

6. Innovative Funding Mechanisms (Legislative)

QUESTION #6

The Committee is interested in new and alternative methods of funding and stimulating environmental R&D. We have proposed funding hazardous waste cleanup R&D by using the "Superfund", for example. Do you agree with this approach, and do you think it should be extended? For example, would you support a broader use of fees to create funds for R&D, such as using an acid rain fund (as proposed in H.R. 3400) and devoting some proportion for demonstration of clean combustion technologies? What about a chemical and electricity fee dedicated to R&D?

ANSWER

As a general matter of good budgetary practice, we oppose the earmarking of governmental revenues for particular expenditure purposes. The level of expenditures to be devoted to any purpose, such as R&D, can be determined satisfactorily through the normal appropriations process. Using a special fund to support R&D expenditures could result in expenditures being determined by receipts with no regard for need.

For this reason, we oppose the use of Superfund revenues to fund hazardous waste cleanup R&D. In addition, using funds for such purposes would dilute the Superfund effort. Furthermore, R&D efforts for hazardous waste cleanup are receiving adequate funding from general revenues.

The Administration has requested a substantial increase in appropriations for research on acid rain. We do not believe it necessary to create a special fund to earmark revenues for R&D projects.

7. Innovative Funding Mechanisms (Industry)

QUESTION #7

Alternatively, what mechanism might be used to shift more of the environmental R&D burden to industry? Are the authorities of TSCA being fully utilized? Should permits under the Clean Air and Clean Water Acts require explicitly more monitoring or might they be conditioned on the permittee doing research on the effects of chemicals being discharged or emitted? Would such requirements/ conditions be enforceable under current law, or would the Acts have to be amended? Would you support such a proposal?

ANSWER

Under TSCA industry pays for and conducts testing of toxic substances.

The Clean Water Act gives permit writers substantial latitude in requiring monitoring and biological studies (bioassays) to be paid for by the permittee. These activities may be needed to determine permissable effluent levels. In general, we have substantial ability to require a permittee to assess the effects of his particular effluents on the particular receiving stream, but little authority to require a permittee to do more general research.

The Clean Air Act relies on ambient standards, based on health and environmental effects, for setting emissions levels on existing sources. Standards for new sources are not based directly on ambient standards, but on available technology. We can and do require air permittees to monitor both emissions and ambient air quality, but rather infrequently require them to perform health effects studies. Under the PSD program, an applicant for a permit may have to conduct studies of the effects of emission on soils, vegetation and materials.

In general, about half of all states charge fees for processing of applications for air and water permits, and in some cases these fee receipts can be used to finance environmental R&D.

We have recommended legislation to amend the Marine Protection Act to expand the range of Federal costs, including R&D, that we can recover from permittees.

It should be noted that in the air and water areas, there are some incentives to encourage innovation. Firms that pursue innovations are given more time to comply with standards. Yet, what constitutes an innovation is narrowly defined. More innovation could be encouraged by broadening the definition of innovation, but that would also increase delays in compliance.

One mechanism which can be used to encourage greater R&D expenditures by industry involves wider use of the "bubble" concept. Under this concept, industry can trade off pollution control techniques that exceed standards against techniques that do not meet standards, while not degrading overall environmental quality. This would reduce one major disincentive to developing innovative and cost-effective pollution control methods: the risk that an untested, innovative technology will not perform as expected. With emissions trading, the cost of partial non-performance of new technology is only the cost of obtaining compensating emissions reductions elsewhere--rather than replacing that technology with a tried-and-true (but perhaps inefficient) emission control system.

8. Setting Environmental R+D Priorities

Question: Please explain as succinctly as possible how EPA's research and development program goals are set, both for the Office of Research and Development and for research funded by program offices. Comment explicitly on how research required by program offices is related to ORD research -- how it is coordinated, contracted to the ORD, etc.

Please provide the Committee with any generic guidelines that spell out how the program offices and ORD are to coordinate; and also provide representative examples of contracts or agreements between program offices and ORD concerning specific research projects.

Answer: Research priorities for a given area are established through a communication and negotiation process with the appropriate client offices. The primary vehicles for fostering this communication are research committees, which have as members managers from the Office of Research and Development (ORD), the regulatory program office, and regional offices. Once each of the committees has expressed its priorities, ORD management must carefully weigh the often competing demands for resources to determine overall research priorities. These overall priorities are developed to respond to the Agency's priorities as expressed by the Administrator in his annual guidance.

The research committees operate according to approved operating guidance. A representative sample of the guidance is attached.

Recently, the Deputy Administrator strengthened the role of research committees in reviewing the scientific and technical activities conducted by the regulatory, regional, policy and legal offices in EPA. The memorandum in which this approach is outlined is also attached.

Finally, research projects are planned and reviewed collegially and cooperatively by ORD and its client offices. While some disagreements or differences inevitably arise, there has been no perceived need to install formal contracts between ORD and its clients for the provision of specific research products and services.

OPERATIONAL GUIDANCE
FOR THE
CONSOLIDATED TOXIC SUBSTANCES AND PESTICIDES RESEARCH COMMITTEE

OFFICE OF RESEARCH AND DEVELOPMENT

AND

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

U.S. ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C.

BACKGROUND

It has been agreed between the Assistant Administrators for ORD and OPTS to consolidate the existing research committees into a single consolidated Toxic Substances/Pesticides Research Committee. It is anticipated that this consolidation will further enhance the research committee system in the following areas:

1. Providing a better mechanism for defining and prioritizing issues and related research needs across all the programs managed by the Office of Pesticides and Toxic Substances.
2. Providing a better mechanism for reaching agreements on research agendas for those research activities which require multi-year funding stability.
3. Improving strategic research planning and resource allocations reflecting both short-term and long-term research activities.
4. Increasing communications at all levels of both organizational entities.
5. Providing a workable vehicle for high-level Regional input to the research planning process.

The purpose of Operational Guidance is fourfold:

1. To define the specific objectives of the Research Committee process;
2. To delineate the role of the Research Committee in the ORD planning process;
3. To select candidates from ORD, OPTS and Regions to serve on the Toxic Substances/Pesticides Committee;
4. To develop a calendar of events for the upcoming planning cycle.

This Operational Guidance expands and formalizes the processes that have been used during the past years in planning the toxic substances and pesticides research activities.

SPECIFIC OBJECTIVES OF THE TOXIC SUBSTANCES/PESTICIDES RESEARCH COMMITTEE PROCESS

1. Identify both short- and long-term research objectives and research products needed to directly support regulatory needs and those needed to form the scientific bases for this support. This objective is paramount and is essential to support development of research plans for the upcoming years FY 1985 and 1986.

2. Serve as a vehicle for OPTS in communicating to ORD any proposed regulatory changes that may impact either current or planned research programs.

3. Provide a vehicle for obtaining regional input into the research planning and review process.

4. Recognize and support the need for stability of funding including maintaining "critical masses" of expertise and state-of-the-art equipment at the ORD laboratories.

5. Recognize and support the need for research activities not directly supporting the immediate regulatory needs for the Agency.

6. Serve as a vehicle for ORD in communicating to OPTS resource changes and their impact both during the planning and implementation years.

7. Review and integrate the OPTS extramural resources into an overall research agenda for solution of issues being addressed concurrently by OPTS and ORD.

8. Provide an opportunity for the ORD Laboratory Directors to have direct input into the planning process.

9. Periodically review the status of current and planned (+1) year research programs focusing on:

    - what is being produced;
    - what use is intended;
    - when it is needed; and
    - changing priorities.

10. Serve as a vehicle for establishing task groups which may be required to further enhance planning and coordination or to provide technical assistance.

11. Provide guidance to Sub-committees which will develop the two research decision units; the guidance will reflect agreements reached between the AA-ORD and the AA-OPTS on issues and research priorities.

ROLE OF TOXIC SUBSTANCES/PESTICIDES RESEARCH COMMITTEE IN PLANNING, COORDINATING, AND REVIEWING OF ORD'S RESEARCH PROGRAMS

In order to clearly articulate the role of the Toxic Substances/ Pesticides Research Committee in planning, coordinating and reviewing ORD'S research programs, a step-by-step delineation of the entire process is presented in this section of the guidance.

I. Administration's Goals

The Administration of EPA has distributed to the AA's and RA's the 34 major goals of EPA. These goals will aid in forming the basis for ORD's research program.

II. AA for ORD Targets and Guidance

To initiate the planning process, the AA of ORD will issue the following:

- tentative resource targets for Toxic Substances and Pesticides;
- Planning guidance and schedules; and
- initiatives the AA of ORD deems necessary for funding.

III. Toxic Substances/Pesticides

ORD will take the initiative in developing the strategic issues for Toxic Substances and Pesticides research. These will be discussed between the AA-ORD and the AA-OPTS, and agreement reached as to the appropriateness, definition and general priority of each issue.

Following this agreement between the AA's, the Research Committee will identify and prioritize the issues and research needs in more detail. This will cover the current planning (+1), budget (+2) and out (+3 and greater) years. By this process, it is anticipated that a comprehensive research agenda can be established rather than focusing on specific projects.

IV. Development of Decision Units (DU)

The major responsibility for the preparation of the DU's (L-104 and E-104) will be that of ORD with policy guidance from the Research Committee. The overall coordination of the preparation of DU's will be that of the ORD Co-chair of Toxic Substances/ Pesticides Committee. Specifically:

1. The ORD Co-chair, in consultation with the OPTS Co-chair, will set resource targets for each DU.

2. Sub-committees will be established to coordinate the development of research decision units at a later date. The subcommittees will be responsible for documentation of the DU's, including input into the Agency budget process.

3. The ORD co-chairperson, in consultation with the Research Committee, will prioritize the research activities of the DU. The prioritization and products should reflect the agreements between the AA-ORD and the AA-OPTS regarding strategic issues and priorities.

4. Each ORD OD will designate a DU and program element writer for his office. These representatives will be members of the sub-committees and who will provide documentation of appropriate parts of the decision unit for the sub-committee chairman.

5. Each OD, through his or her DU writer(s) will be responsible for the integrity of their portion of the DU's including input from the respective laboratories.

6. The Program Coordination Staff (PCS) will serve as staff to the ORD co-chairperson and the Research Committee. In addition, PCS will also assist the sub-committee chairmen in the DU development and will serve as a point of coordination with other committees (e.g., Air, Water).

V. Review, Adjustments and Concurrence of DU's

The ORD Co-chair will present to the Toxic Substances/Pesticides Research Committee a summary of their DU's for ORD's research program. The major purpose of this review is to determine if the DU's reflect the priorities, products, and schedules presented in the strategy.

VI. ORD's Research Ranking Process

The Research Committee will rank the Toxic Substances/Pesticides DU's for the budget year (+2) to provide advisory guidance for ORD to use in its own ranking process.

VII. Agency Decision Process

It is the responsibility of the ORD co-chair to inform the OPTS co-chair of ORD and Agency decisions regarding the toxic substances/pesticides research programs.

VIII. OMB Deliberations

When necessary, Office Directors, the two co-chairs, and Laboratory Directors, after the formal hearings, may interact with OMB to defend the budget request. The specific individual interacting with OMB will depend on the nature of the deliberation, i.e., discipline versus programmatic.

IX. Preparation of Planned Program Accomplishments (PPA's) for (+1) Year

After the budget request has been submitted by the President and Congressional action has been taken, it is the responsibility of the ORD OD's and laboratory directors to prepare the PPA's and Project Descriptions (PD's). It is the responsibility of the ORD Co-chair to see that the PPA's and PD's are sent to members of the Toxic Substances/Pesticides Research Committee.

X. Review of Planned Research Program

Once the research plans are developed for (+1) year, the Toxic Substances/Pesticides Research Committee, in conjunction with appropriate OD's and Laboratory Directors, will conduct a program review of the budget and program plans for the operating year. It may be desirable to use the sub-committees for more detailed tracking, with results and issues transmitted to the Research Committee. The ORD OD's will be responsible for tracking the status of the research deliverables and keeping the OPTS Co-chair informed of the status and progress of research activities.

XI. Task Groups

For detailed research planning, the co-chairs of OPTS and ORD will establish task groups to refine research needs and priorities related to specific areas and address specific technical issues. It is the responsibility of the two co-chairs to ensure appropriate OD laboratory and OPTS personal participation in these task groups. The results of these Task Forces will be transmitted to the Research Committee, which will use them to develop guidance for the ORD OD's or sub-committees.

XII. Communications and Information Exchange

The two Co-chairs will serve as the main vehicle of communication and information exchange regarding the planning and budgeting process. However, communications and information exchange is encouraged at all levels of both organizational entities and with the Regions especially on technical matters.

RESEARCH COMMITTEE STRUCTURE

Success of the consolidated Toxic Substances/Pesticides Research Committee will be dependent on the two Co-chairs. To ensure success, the OPTS Co-chair will be from the immediate office of the Assistant Administrator of Pesticides and Toxic Substances and the ORD Co-chair should be a representative of equivalent seniority. The AA for ORD will designate who will be ORD's Co-chairperson.

The supporting members of the Committee will consist of appropriate representatives from the Office of Pesticides and Toxic Substances. For ORD, supporting members will consist of appropriate representatives from both ORD headquarters and laboratories. In addition, the two Regional representatives will be members of the Toxic Substances/Pesticides Research Committee and will represent all Regional interests.

For development of the decision units and to provide back-up for evaluation of research there will be two sub-committees: Toxic Substances and Pesticides.

For numerous reasons, committee membership will change periodically. Consequently, a membership review will be conducted prior to each year's planning cycle. This budget year (1986) will consist of the following:

ORD

OPTS

REGIONS

CALENDAR OF EVENTS

Listed is a proposed Fiscal Year Calendar of Events

Time Frame	Committee Activity
Oct/Nov	Update Operational Guidance and review membership
Nov/Dec	Draft of strategy prepared
Jan/Feb	Review and comment on strategy Sign-off by AA's
Feb/Mar	MEETING: Program review and initial communication of research needs and priorities for budget (+2) year
Mar/Apr	Receive ORD Guidance
Apr/May	Develop DU's
May/Jun	MEETING: Review DU summaries for budget (+2) year and PPA's for planning (+1) year
Jun/Jul	ORD Ranking
Jul/Aug	Agency Decision/Review
sep/Oct	Budget submitted to OMB
Sep/Oct	MEETING: Program review of program plans for the operating year
Nov/Dec	Input to President's Budget

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

April 4, 1984

OFFICE OF
RESEARCH AND DEVELOPMENT

SUBJECT: Improving the Quality of Science Agency-Wide

FROM: Alvin L. Alm /s/
Deputy Administrator (A-101)

TO: Assistant Administrators
Regional Administrators
General Counsel
Associate Administrators
The Inspector General

The Administrator and I are keenly aware of the need for accuracy, consistency and validity in EPA's scientific endeavors. The effectiveness of EPA's entire mission is compromised by faulty scientific or technical efforts undertaken anywhere in the Agency. A major responsibility of the Office of Research and Development is to ensure that such efforts either within ORD or funded by ORD are of the highest quality. However, not all EPA scientific and technical efforts are sponsored by ORD.

As the major repository of scientific and technical expertise in EPA, ORD has the responsibility to offer such expertise to other portions of the Agency. Previous failures to provide this assistance have had major adverse consequences on the reputation for scientific and technical competence of all work performed by the Agency, and on the credibility of regulatory decisions based on this work. Furthermore, the performance of scientific and technical efforts independent of ORD has in the past led to significant duplication of effort as well as embarrassment when the results were announced.

To eliminate these problems in the future and encourage interaction between Agency scientists, I am instituting the following two policy changes. The first policy change deals with budget year planning and the second deals with operating year program implementation.

1. Budget Year Planning

During the deliberations of the Research Committees early in the fiscal year, Agency program staff and regional office personnel should come to the meetings prepared to lay out their budget-year extramural resource plans related to scientific and technical efforts. These plans should be broken down as specifically as possible by primary categorical technical area. ORD will present its extramural and in-house research efforts. Open discussion of these plans should help avoid overlap, facilitate agreement on the allocation of all Agency research resources, and ultimately lead to the production of better quality research results.

2. Current Year Program Implementation

Current year program implementation will involve the joint efforts of both the ORD and Program Office Research Committee Co-chairpersons. During the operating year, as Program Offices, Regions, OPPE, OGC, and OECM initiate research-related procurement actions or assistance agreements in areas agreed to during the previous budget year planning process, a brief synopsis of each should be sent to the Research Committee Co-chairpersons for screening. I anticipate that over 90% of these will require no further attention; however, a small percentage of them will raise concerns and will require a more detailed review. In these cases, the Co-chairpersons will jointly agree to delegate to appropriate Agency scientists and engineers the responsibility for conducting a quick internal peer review of the task to ensure that the scientific design is fundamentally sound and does not duplicate other on-going research. No sign-off by the Co-chair is required, but if conflicts or problems arise during the review, the concerns will be transmitted by the Research Committee Co-chairperson to the appropriate Assistant Administrators for resolution. This entire process is to be completed within 30 days. If no response is received by the Assistant Administrator within 30 days, concurrence will be assumed. If a conflict does arise, and no amicable resolution appears likely, the matter is to be brought to my immediate attention. Under any circumstances, an Assistant Administrator can ask that an issue receive priority attention, but the request must be made in writing by the Assistant Administrator, Regional Administrator or General Counsel directly to the Assistant Administrator for Research and Development; a staff level discussion will not suffice. This internal pre-review, incidentally, bears no relationship to the publication review required under Agency Order 2200.

The basic guiding principles for the development of this approach are:

A. ORD has neither the desire nor the time to closely investigate all scientific and technical efforts planned by other parts of EPA. Nor does ORD wish to take over the work now being funded by other EPA offices.

B. The logical organizations to provide overview and to ensure appropriate communication are the Research Committees. There are five Research Committees; four, corresponding to the program offices, are air, water, toxics and pesticides, and superfund and solid waste. These are co-chaired by the program office and ORD, and will have high level representation from the Regions. A fifth Research Committee deals with multi-media and energy issues. Over 90% of ORD's in-house and extramural research is planned in these committees. The exception is the exploratory grants and centers program for university-based research.

Peer review and quality assurance are integral to all of our scientific activities. Part of the Research Committees' oversight role would be to make certain that each planned scientific or technical project had appropriate peer review and quality assurance planning incorporated at the onset of the project. Accordingly, each Assistant Administrator and Regional Administrator should establish a system to assure that all studies undertaken incorporate adequate plans and budget for peer review and quality assurance prior to review by the Research Committees.

I believe the implementation of these policies will help assure the scientific results produced by the Agency are of the highest quality; I look forward to your cooperation.

9. Interagency Coordination

Question: Obviously much of EPA's R&D is related to research conducted by other Federal agencies, such as the National Institute of Health, the National Institute of Environmental Health Sciences, the Center for Disease Control, the Department of Energy, and so on.

Describe succinctly procedures for coordinating that research, and then provide the Committee with copies of any interagency agreements to which EPA is a party that concern cooperation or coordination of environmental R&D.

Answer: EPA coordinates research with other agencies through three types of mechanisms: interagency task forces (e.g., acid rain); interagency agreements (e.g., groundwater coordination with USGS); and through informal contacts with researchers and management in other agencies (e.g., ocean research with the National Oceanic and Atmospheric Administration). In interagency agreements (IAGs), EPA may transfer funds to another agency to support research which EPA needs, or EPA may receive funds for carrying out research which is of interest to another agency as well as EPA. A list of IAG's which EPA has with other agencies which involve research is attached.

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                                                 GRANTS INFORMATION & CONTROL SYSTEM

                                          REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER        AGENCY                          FUNDS AWARDED  CITY               STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD      GS
  OLD NUMBER      DEPARTMENT                        PMG ELMT     EPA LAB                                               EPA PROJ OFFICER
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 W  930648010     GENERAL SERVICES ADMIN.           20,000     WASHINGTON          DC  FP03-02-84     A 831007      10-01-83  09-30-84   PB
                  NATIONAL ARCHIVES & RECOR   M                EMSL/LV                                               WEHR,V
           TITLE: COPYING OF AERIAL NITRATE FILM

                                                    20,000
                                                         1

DW  930007010     ENERGY DEPT.                                 LAS VEGAS           NV  FP03-03-83                   02-09-83  02-09-84   PB
  AD89F30581      OAK RIDGE NATIONAL LAB      CBSD1A                                                                 WILLIAMS, L.
           TITLE: EVALUATION OF METHODS FOR DETERMINING THE HAZARDS OF SOLID WASTE

DW  930007013     ENERGY DEPT                      270,000     OAK RIDGE           TN  F 11-14-83     A 831129      02-01-83  01-31-85   PB
  AD89F30581       OAK RIDGE NATIONAL LAB     BGQ028                                                                 WILLIAMS,L.
           TITLE: EVALUATION OF METHODS FOR DETERMINING THE HAZARDS OF SOLID WASTE

DW  930007014     ENERGY DEPT                       65,000     OAK RIDGE           TN  F 01-10-84     A 840217      02-01-83  01-31-85   PB
                  OAK RIDGE OPERATIONS OFFI   CBSD1A                                                                 WILLIAMS,L
           TITLE: EVALUATION OF METHODS FOR DETERMINING THE HAZARDS OF SOLID WASTE

DW  930011010     COMMERCE DEPT.                    37,540     WASHINGTON          DC  F 11-19-80                   12-18-80  09-30-82   PB
  AD13F24670      NATIONAL BUREAU OF STANDA   CBSD1A                                                                 A JARVIS
           TITLE: EPA NBS STANDARD REFERENCE MATERIALS PROGRAM

DW  930011011     COMMERCE DEPT.                    11,000     WASHINGTON          DC  F 05-06-83     A 830622      01-01-83  09-30-84   PB
  AD13F3467       NATIONAL BUREAU OF STANDA   CBLC1A                                                                 JARVIS, ARTHUR
           TITLE: HAZARDOUS WASTE/RADIOLOGICAL POLLUTANT REFERENCE MATERIAL PROGRAMS

DW  930011012     COMMERCE DEPT                     89,500     WASHINGTON          DC  F 02-07-84     A 840222      11-01-83  12-31-84   PB
                  NAT'L BUREAU OF STANDARDS   CCHL1A                                                                 WILLIAMS,L
           TITLE: HAZARDOUS WASTE/RADIOLOGICAL POLLUTANT REFERENCE MATERIAL PROGRAMS

DW  930057011     ARMY MEDICAL RES & DEVEL          60,000     FREDERICK           MD  F 05-26-83     A 830722      12-15-82  02-28-84   PB
  AD21F2A191                                  CBSD1A                                                                 WILLIAMS, L.
           TITLE: EVALUATING AQUATIC TOXICITY BIOASSAY USING DAPHNIA MAGNA

DW  930057013     U.S. ARMY MEDICAL R&D COM         35,000     FREDERICK           MD  F 02-10-84                   12-15-82  12-31-84   PB
                                              CBSB1A                                                                 WILLIAMS,L
           TITLE: EVALUATING AQUATIC TOXICITY BIOASSAY USING DAPHIA MAGNA

DW  930058010     INTERIOR DEPT                     99,000     DENVER              CO  FP02-25-83     A 830422      01-15-82  01-15-86   PB
                  GEOLOGICAL SURVEY           CBLC1A                                                                 VANEE JEFFREY
           TITLE: GEOPHYSICAL SENSING OF FLUID MOVEMENT FROM INJECTION WELLS

DW  930068010     AIR FORCE                         25,000     WRIGHT-PATTERSON    OH  FP02-15-83     A 830418      10-01-82  09-30-83   JR
                  AVIONICS LAB.               CBSD1A                                                                 HOWARD, GORDON
           TITLE: ENGINEERING, MAINTENANCE & SENSOR DEVELOPMENT SUPPORT FOR ENVIRO-POD PROGRAM
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                                    GRANTS INFORMATION & CONTROL SYSTEM

                              REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                           FUNDS AWARDED  CITY              STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD      OS
  OLD NUMBER    DEPARTMENT                           PRG ELMT   EPA LAB                                              EPA PROJ OFFICER
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DW  930077012    ENERGY DEPT                           38,400    IDAHO FALLS        NY  F 12-06-83    A 840103     02-01-83  09-01-84    JH
                 CONTRACT LAB,EG+G INC              TEDY1A      EMSL/LV                                            DELLARCO,VV
           TITLE: BIOLOGICAL METHODS FOR MONITORING HAZARDOUS WASTESASSESSING RISK FROM EXPOSURE TO ANEUPLOIDY-INDUCIN
DW  930084010    ENERGY DEPT                           84,000    RICHLAND           WA  FP04-01-83    A 830422     10-01-82  09-30-85    PM
                 BATTELLE MEMORAL LAB.              CCRL1A                                                         FLATMAN, G.
           TITLE: APPLICATION OF GEOSTATISTICS TO MONITORING SYSTEMS AND DATA ANALYSIS

DW  930084011    ENERGY DEPT                            1,100    RICHLAND           WA  F 11-25-83    A 831212     10-01-83  09-30-85    PM
                 RICHLAND OPER. OFFICE              CCRL1A                                                         FLATMAN,G
           TITLE: APPLICATION OF GEOSTATISTICS TO MONITORING SYSTEMS AND DATA ANALYSIS
DW  930191010    INTERIOR DEPT                         24,150    DENVER             CO  FP06-13-83                 04-01-83  03-31-84    PM
                 GEOLOGICAL SURVEY                  CBLC1A                                                         VANEE, JEFF
           TITLE: PLUME SENSING/FEASIBILITY OF USING COMPLEX RESISTIVITY TO LOCATE UNDERGROUND CONTAMINANTS

DW  930389010    ENERGY DEPT, OF                        9,950    IDAHO FALLS        ID  FP09-20-83                 09-01-83  09-30-83    MJ
                 IDAHO OPERATIONS                   CAPB1A                                                         EVANS,ROY
           TITLE: POSITION PAPER ON EPA MONITORING PROGRAMS

DW  930537010    NASA                                  20,000    HAMPTON            VA  FP11-25-83
                 LANGLEY RESEARCH CTR               H                                                                                MJ
           TITLE: LASER REMOTE MONITORING OF AIRBORNE POLLUTANTS WOM LIGHT AIRCRAFT                                 MCELROY,J

DW  930548011    ENERGY DEPT OF                       150,000    OAKLAND            CA  F 12-09-83    A 840124     10-01-83  09-30-85    PM
  AD89FA074      SAN FRANCISCO OPERATIONS           CBLC1A                                                         ADAMS,C
           TITLE: MONITORING GROUNDWATER WITH FIBER OPTICS TECHNOLOGY

DW  930724010    INTERIOR, DEPT OF                     33,000                       DC  FP03-15-84
                                                    H                                                                                MJ
           TITLE: ANALYTICAL SUPPORT FOR NATIONAL LAKE SURVEY - PHASE I, ACID DEPOSITION PROGRAM                     MEIER,E

                                                    1,052,590
                                                           18

RW  930003010    NAVAL OCEAN R&D STATION               15,000    LAS VEGAS          NV  FP01-20-83                 12-01-82  09-30-83    PM
                 NAVAL OCEAN R & D STATION          X6EM10                                                         SHELTON, GARY
           TITLE: REMOTE SENSING SUPPORT

RW  930113010    MONTANA, UNIV. OF                        800    MISSOULA           MT  FP02-15-83    A 830328     02-14-83  09-30-83    PM
                 DEPT. OF GEOLOGY                   X6EM10                                                         SHELTON, G.
           TITLE: REMOTE SENSING SUPPORT

RW  930148011    ARMY TOXIC&HAZARDOUS MATE             31,500    ABERDEEN           MD  F 07-07-83                 10-01-83  09-30-84    PM
  AR21F3202                                         X6EM10                                                         WEBB, VERNARD
           TITLE: PROJECT R99- INITIAL INSTALLATION ASSESSMENT
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                                 REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                                 FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD      OS
  OLD NUMBER    DEPARTMENT                              PRG ELMT      EPA LAB                                            EPA PROJ OFFICER
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RW  930148012   DEFENSE DEPT                               12,325     ABERDEEN          MD  F 08-16-83                   10-01-83  09-30-84   PB
  AR21F2202     ARMY TOXIC & HAZARDOUS MA          X6EM10             EMSL/LV                                             WEBB, V.
           TITLE: R-99 INITIAL INSTALLATION ASSESSMENT
RW  930148014   U.S. ARMY TOXIC & HAZ. MA                  30,000     ABERDEEN          MD  F 02-08-84                   10-01-83  09-30-84   PW
                DRXTH-PM                           H                                                                      WEBB,V
           TITLE: PROJECT R99- INITIAL INSTALLATION ASSESSMENT

RW  930148015   ARMY, DEPT OF                                         ABERDEEN          DC  F 04-05-84                   10-01-83  09-30-84   PW
                                                   XBE                                                                    WEBB,V
           TITLE: PROJECT R99- INITIAL INSTALLATION ASESSMENT

RW  930160010   ARMY                                       42,000     FORT IRWIN        CA  FP06-09-83                   03-01-83  12-30-83   PB
                                                   X6EM10                                                                 SHELTON, G.
           TITLE: REMOTE SENSING SUPPORT

RW  930171010   INTERIOR DEPT                              25,000     AMARILLO          TX  FP06-09-83    A 830609       03-01-83  09-30-83   JF
                BUREAU OF RECLAMATION/SW           X6EM10                                                                 SHELTON, G.
          . TITLE: REMOTE SENSING SUPPORT/LAKE MEREDITH SALINITY CONTROL PROJECT TEXAS & NEW MEXICO
RW  930224010   INTERIOR DEPT                              17,100     VALE              OR  FP07-11-83    A 830509       06-01-83  12-31-83   JH
                BUREAU OF LAND MANAGEMENT          X6EM10                                                                 SHELTON, GARY
           TITLE: REMOTE SENSING SUPPORT
RW  930225010   INTERIOR DEPT.                             51,000     WASHINGTON        DC  F 02-01-83                   08-01-83  05-30-84   JH
  AR14F25893    NATIONAL PARK SERVICE              X6EM10                                                                 G SHELTON
           TITLE: REMOTE SENSING SUPPORT

RW  930225011   INTERIOR DEPT                              40,000     DENVER            CO  F 06-27-83    A 830420       08-01-83  05-30-84   JH
  AR14F3589     NATIONAL PARK SERVICE              X6EM10                                                                 SHELTON, G.
           TITLE: REMOTE SENSING SUPPORT

RW  930243010   NAVY DEPT.                                 65,003     WASHINGTON        DC  F 02-01-83                   01-01-82  12-31-82   JH
  AR17F2A111    SECRETARY OF THE NAVY              X6EM10                                                                 A PITCHFORD
           TITLE: VISIBILITY NOMONITORING SUPPORT

RW  930243011   NAVY DEPT                                 220,000     CHINA LAKE        CA  F 07-26-83                   04-04-83  12-31-85   JH
  AR17F3A111    NAVAL WEAPONS CENTER               X6EM10
           TITLE: VISIBILITY PORTECTION PROGRAM FOR THE R-2508 AIR SPACE
RW  930243012   DEFENSE DEPT                              120,000     CHINA LAKE        CA  F 08-25-83                   07-05-83  12-31-85   JH
                NAVAL WEAPONS CENTER               X6EM10                                                                 PITCHFORD, ANN
           TITLE: VISIBILITY PROTECTION PROGRAM FOR THE R-2508 AIRSPACE
RW  930250011   INTERIOR DEPT                              17,000     WASHINGTON        DC  F 07-07-83    A 830512       04-01-82' 09-30-83   JH
  AR14F3874     OFFICE OF SURFACE MINING/          X6EM1A                                                                 SHELTON, GARY
           TITLE: REMOTE SENSING SUPPORT OF ABANDONED MINE LAND PROJECTS
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IAG NUMBER     AGENCY                        FUNDS AWARDED  CITY              STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       GS
  OLD NUMBER   DEPARTMENT                       PRG ELMT    EPA LAB                                              EPA PROJ OFFICER
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RW  930250020  INTERIOR DEPT.                     23,000    WASHINGTON         DC  F 12-08-80                    04-01-82  09-30-83   JM
  AR14F28742   BUREAU OF MINES                  X6EM10      EMSL/LV                                               G SHELTON
         TITLE: REMOTE SENSING SUPPORT

RW  930266010  INTERIOR DEPT.                      7,500    SLIDELL            LA  FP11-22-82                    11-01-82  03-15-83   JM
  AR14F3A112   US FISH & WILDLIFE SER           X6EM10                                                            SHELTON, GARY
         TITLE: REMOTE SENSING SUPPORT

RW  930266011  INTERIOR DEPT                      58,000    SLIDELL            LA  F 07-13-83    A 830606        05-15-83  09-30-83   JM
  AR14F3A112   FISH & WILDLIFE SERVICE          X6EM10                                                            SHELTON, G.
         TITLE: REMOTE SENSING SUPPORT

RW  930267010  INTERIOR DEPT                       3,000    DENVER             CO  FP07-13-83    A 830520        06-01-83  09-30-83   JM
               BUREAU OF RECLAMATION            X6EM10                                                            SHELTON, G.
         TITLE: REMOTE SENSING SUPPORT, WADDELL DAM, ARIZONA

RW  930269010  DEFENSE DEPT                       60,000    TWENTYNINE PALMS   CA  FP07-15-83                    07-01-83  12-30-84   JM
               NAVY-MARINE CORPS                X6EM10                                                            SHELTON, G.
         TITLE: REMOTE SENSING SUPPORT

RW  930316011  INTERIOR DEPT                       5,000    DENVER             CO  F 12-12-83                    05-15-83  09-30-84   JF
               BUREAU OF RECLAMATION            M                                                                 SHELTON,G
         TITLE: REMOTE SENSING SUPPORT AT VARIOUS LOCATIONS

RW  930316012  INTERIOR DEPT OF                   24,000    DENVER             DC  F 03-27-84    A 840130                             JF
               BUREAU OF RECLAMATION            M                                                                 SHELTON,G
         TITLE: REMOTE SENSING SUPPORT, FONTENELLE DAM, WYOMING

RW  930360010  MONTANA DEPT HEALTH & ENV             500    HELENA             MT  FP09-02-83                    08-01-83  06-30-84   JM
                                                X6EM10                                                            SHELTON, G.
         TITLE: REMOTE SENSING SERVICES

RW  930369010  ARIZONA STATE GOVT                  1,582    PHOENIX            AZ  FP09-02-83                    06-11-83  12-30-83   JM
               DEPT OF HEALTH SERVICES          X6EM10                                                            SHELTON, G.
         TITLE: REMOTE SENSING SUPPORT

RW  930376010  INTERIOR DEPT.                     43,000    WASHINGTON         DC  F 02-01-83                    04-01-82  09-30-83   JM
  AR14F28741   OFFICE OF SURFACE MINING         X6EM10                                                            G SHELTON
         TITLE: REMOTE SENSING SUPPORT

RW  930377010  AGRICULTURE DEPT OF                 5,000    PORTLAND           OR  FP09-09-83                    08-15-83  09-30-83   PB
               PACIFIC NORTHWEST FOREST         X6EM10                                                            SHELTON,GARY
         TITLE: REMOTE SENSING SUPPORT

RW  930483010  INTERIOR DEPT OF                   10,000    MENLO PARK         CA  FP11-01-83    A 831007        10-10-83  12-30-83   MJ
               U.S. GEOLOGICAL SURVEY           X6EM10                                                            SHELTON,GARY
         TITLE: REMOTE SENSING SUPPORT
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IAG NUMBER      AGENCY                             FUNDS AWARDED  CITY                 STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD     GS
  OLD NUMBER    DEPARTMENT                          PRG ELMT      EPA LAB                                                 EPA PROJ OFFICER
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RW  930536010    INTERIOR DEPT                          75,000    ALBUQUERQUE           NM  FP11-22-83    A 831221      10-01-83  09-30-84   MJ
                 NAT'L MARINE FISHERIES SE          TFAY9A        EMSL/LV                                                SHELTON,G
           TITLE: REMOTE SENSING SUPPORT

RW  930567010    INTERIOR DEPT                          50,000    ALBUQUERQUE           NM  FP12-09-83    A 831104                           MJ
                 US.FISH & WILDLIFE SERV            H                                                                    SHELTON,G
           TITLE: REMOTE SENSING SUPPORT

RW  930649010    COMMERCE DEPT OF                       20,000    ROCKVILLE             MD  FP01-31-84    A 830607      10-01-83  09-30-88   MJ
                 NOAA                               X6E10                                                                WEBB,V
           TITLE: AERIAL PHOTOGRAPHIC SUPPORT & COORDINATION
                                                     1,080,307
                                                            30

                                                     2,152,897
                                                            49

DW  930170010    ACID DEPOSITION SYSTEM                140,000    RICHLAND              WA  F 01-05-83                  01-05-83  01-05-84   PB
  AD89F3A404     PACIFIC NW LAB                     B             EMSL/RTP                                               EVANS, E. G.
           TITLE:

DW  930170011    ENERGY DEPT                           109,000    RICHLAND              WA  FP06-08-83    A 830711      07-01-83  07-01-84   PB
  AD89F3A404     PACIFIC NW LAB                     CCVN1A                                                               EVANS, E.G.
           TITLE: ACID DEPOSITION SYSTEM FOR STATISTICAL REPORTING

DW  930479010    ENERGY DEPT. OF                       125,000    BERKELEY              CA  FP11-07-83    A 840104      11-01-83  11-01-84   PB
                 LAWRENCE BERKELEY LAB              CBSD1A                                                               SCOTT,D.
           TITLE: DEVELOPMENT OF TALMS MONITOR FOR MULTICOM POUND ANALYSIS OF TOXIC ORGANIC COMPOUNDS

DW  930628010    COMMERCE DEPT OF                      620,000    WASHINGTON            DC  FP02-07-84    A 840305      01-01-84  12-31-86   PB
                 NAT'L BUREAU OF STANDARDS          C9UA1B                                                               HAUSER,T
           TITLE: IMPROVE MEASUREMENT METHODS FOR CALIBRATION AND DEVELOPMENT OF STANDARD REF. MATER.

DW  930650010    ENERGY DEPT OF                         99,988    RICHLAND              WA  FP02-02-84    A 840213      02-01-84  01-31-87   MJ
                 BATTELLE PACIFIC N.W. LAB          CCML1A                                                               WILSON,W
           TITLE: CONDUCT SUPERCRITICAL FLUID EXTRACTION & CHROMATOGRAPHY-MASS SPECTROMETRY OF PARTICUL.

                                                     1,093,988
                                                             5
                                                     1,093,988
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                                REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER       AGENCY                        FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD     GS
  OLD NUMBER     DEPARTMENT                      PRG ELMT     EPA LAB                                             EPA PROJ OFFICER
DW--930100010----ENERGY-DEPT---------------------260,000----WASHINGTON---------DC--FP06-13-82--------------------08-01-83--10-31-84---JR.
                 LAWRENCE/BERKELEY LAB           CRPC1A       ERL/ADA                                             KEELY, J.F.
           TITLE: STUDY OF KEY ISSUES IN AQUIFER RESTORATION & CONTAMINANT CLEANUP
DW  930349010    ENERGY DEPT                      243,500     WASHINGTON        DC  FP08-31-83    A 830930                               JH
                 BROOKHAVEN NATIONAL LAB          CRPC1A                                                          MCNABB, JAMES
           TITLE: METHODOLOGY TO ASSESS AQUIFER IMPACTS FROM DISPARATIC DATA

DW  930350010    ENERGY DEPT OF                   175,000     RICHLAND          WA  FP09-20-83                   07-01-83  06-30-84    JF
                 BATTELLE PACIFIC NORTHWES        CRPC1A                                                          DUNLAP,W.J.
           TITLE: FATE OF ORGANIC CONTAMINANTS IN SOIL

DW  930615010    AIR FORCE                        110,000     TYNDALL AFB       FL  FP02-17-84    A 831213       11-01-83  09-30-84    MJ
                 ACFC                             ABEM1B                                                          DUNLAP,W
           TITLE: INORGANIC SOIL AND ORGANIC SOLVENT INTERACTIONS

DW  930722010    ENERGY, DEPT OF                   90,000                       DC  FP04-05-84    A 840405       04-01-84  03-31-85    MH
                                                  TEXY1A                                                          KEELY,J
           TITLE: VERIFICATION OF ANALYTIC AND SEMI-ANALYTIC METHODS FOR THE PERFECTION OF CONTAMINANT TRANSPORT

                                                  868,500
                                                        S

                                                  868,500
                                                        S

DW  930034010    ENERGY DEPT,                     100,000     WASHINGTON        DC  F 11-29-80                   03-01-83  02-28-84    JM
  AD09F25480     AMES LAB                        CCUL1A       ERL/ATHENS                                          T HOOVER
           TITLE: INDUCTIVELY COUPLED ARGON PLASMA FOR MULTIELEMENT ANALYSIS

DW  930034011    ENERGY DEPT,                                 AMES              IA  F 04-26-83    A 830426       03-01-83  02-28-84    JM
  AD09F35480                                     CCUL1A                                                           HOOVER, THOMAS
           TITLE: INDUCTIVELY COUPLED ARGON PLASMA FOR MULTICLAMENT ANALYSIS

DW  930092010    INTERIOR DEPT                     50,000     WASHINGTON        DC  F 12-11-80                   06-15-82  06-15-87    JF
  AD14F2A212                                     CCME1A                                                           R CARSEL
           TITLE: INITIATE & PURSUE HAZARDOUS WSTE MNGMT SCNCE TECHNNIGRATION OF PESTICIDES THROUGH ZONES AT SITE DOUG

DW  930092011    INTERIOR DEPT                                DORAVILLE         GA  F 04-12-83                   06-15-82  06-15-87    JF
  AD14F3A212     GEOLOGICAL SURVEY               CRPC1A                                                           CARSEL, R.
           TITLE: MIGRATION OF PESTICIDES THRU UNSATURATED & SATURATED ZONES AT SELECTED SITES IN NW DOUGHERTY CO, GA.
DW  930092012    GEOLOGICAL SURVEY, U.S.           15,000     DORAVILLE         GA  F 09-20-83                   06-15-82  06-15-87    JF
                 WATER RESOURCES DIV             BFJE3A                                                           CARSEL, R
           TITLE: MIGRATION OF PESTICIDES THROUGH THE UNSATURATED & SATURATED ZONES AT A SELECTED SITE IN NW DOUGHERTY

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                                        GRANTS INFORMATION & CONTROL SYSTEM
                                 REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER
IAG NUMBER       AGENCY                              FUNDS AWARDED  CITY                STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       OS
  OLD NUMBER     DEPARTMENT                            PRG ELMT     EPA LAB                                                EPA PROJ OFFICER
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DW  930031010    ENERGY DEPT                            25,000     WASHINGTON          DC  FP03-23-83     A 830407
                 BATTELLE LAB.                        TEKY1A       ERL/COR                                                                      PW
           TITLE: USERS GUIDE TO EFFECTIVENESS OF SELECTED CHEMICAL DISPERSANTS                                            PETERSON, S.

DW  930032010    ENERGY DEPT.                           80,000     WASHINGTON          DC  F 12-04-80                    09-15-83  06-30-83    PW
  AG09F2A115     PACIFIC NORTHWEST LAB                TEKY1A                                                              MANIERE, L.
           TITLE: PREPARATION OF SUPERFUND TECHNICAL RESOURCE DOCUMENTS
DW  930032020    ENERGY DEPT.                           29,500     RICHLAND            WA  FP02-10-83     A 830407      09-15-83  06-30-83    PW
  AG09F3A115     BATTELLE MEMORIAL LAB.               TEKY1A                                                              MANIERE, L.
           TITLE: PREPARATION OF SUPERFUND TECHNICAL RESOURCE DOCUMENTS
DW  930070012    INTERIOR, DEPT OF                     257,000     WASHINGTON          DC  F 04-04-84                    10-01-82  09-30-86    JR
                                                      CCVN1A                                                              WILHUR,R
           TITLE: EFFECTS OF ACIDIC DEPOSITION ON FISH AND WILDLIFE RESOURCES AND THEIR HABITS
DW  930079010    ENERGY DEPT.                                      OAK RIDGE           TN  FP03-12-83     A 820427      02-01-83  01-31-85    JR
                 OAK RIDGE NATIONAL LABORA   CCVN1A                                                                       WILHOUR, RAY
           TITLE: TREE RING ANALYSIS TO ASSESS ACID PRECIPATION CHANGES IN FOREST PRODUCTIVITY

DW  930117010    ENERGY DEPT.                          150,000     OAK RIDGE           TN  FP04-27-83     A 830517      10-01-82  09-30-84    JR
                 OAK RIDGE LAB.                      CCVN1A                                                               WILHOUR, R.
           TITLE: COMPARATIVE EVALUATION OF IMPACTS OF ACID PRECIPITATION ON FOREST SOILS

DW  930118010    ENERGY DEPT.                          150,000     OAK RIDGE           TN  FP04-27-83     A 830517      10-01-82  09-30-84    JR
                 OAK RIDGE LAB.                      CCVN1A                                                               WILHOUR, R.
           TITLE: TERRESTIAL IMPACTS OF ACIDIC DEPOSITS ON DECIDUOUS FORESTS IN TV REGION--MODELING INPUT/OUTPUT RELATI
DW  930125010    INTERIOR DEPT.                         51,020     WASHINGTON          DC  FP04-28-83     A 830615      04-01-83  03-31-85    JR
                 FISH & WILDLIFE SERVICE             CCVN1A                                                               CHAPMAN, G.
           TITLE: FISH COMMUNITY STRUCTURE IN POTENTIALLY ACID-SENSITIVE STREAMS OF SOUTHERN BLUE RIDGE PROVINCE

DW  930126010    ENERGY DEPT.                           75,000     ARGONNE             IL  FP05-02-83     A 830527      04-01-83  03-31-85    JR
                 ARGONNE NATIONAL LAB.               CCVN1A                                                               LEE, J.
           TITLE: EFFECTS OF TEMPORAL VARIATIONS IN ACIDITY OF RAIN ON CROP RESPONSE TO ACIDIC DEPOSITION

DW  930126011    ENERGY DEPT OF                                    ARGONNE             IL  F 02-06-84     A 840322      04-01-83  03-31-85    JR
                 ARGONNE NAT'L LAB                   H                                                                    LEE,J
           TITLE: EFFECTS OF TEMPORAL VARIATIONS IN THE ACIDITY OF RAIN ON CROP RESPONSE TO ACIDIC DEPOSITION
DW  930152010    ENERGY DEPT                            65,000     WASHINGTON          DC  FP07-19-83     A 830719      04-01-83  03-31-85    JR
                 OAK RIDGE NATIONAL LAB.             CCVN1A                                                               WILHOUR, R.
           TITLE: INTERACTIVE EFFECTS OF ACID RAIN & GASEOUS POLLUTANTS ON NATURAL TERRISTIAL VEGETATION

DW  930152011    ENERGY DEPT                            20,000     WASHINGTON          DC  F 08-25-83     A 830930      10-01-82  03-31-85    JR
                 OAK RIDGE NATIONAL LAB              CCVN1A                                                               WILHOUR, R.
           TITLE: INTERACTIVE EFFECTS OF ACID RAIN & GASEOUS POLLUTANTS ON NATIONAL TERRESTRIAL VEGETATION
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                                          GRANTS INFORMATION & CONTROL SYSTEM
                                   REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                          FUNDS AWARDED  CITY              STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD     GS
  OLD NUMBER    DEPARTMENT                           PRG ELMT   EPA LAB                                             EPA PROJ OFFICER
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DW  930196010   ENERGY DEPT                          93,000    UPTON             NY  FP06-15-83    A 830708       04-01-83  03-31-85   JF
                BROOKHAVEN NATIONAL LAB.     CCVN1A            ERL/COR                                            LEE, J. J.
          TITLE: FREQUENCY/DURATION/WATER DEPOSITION RATES/SIMULATED ACIDIC PRECIPITATION/YIELD/QUALITY FIELD-GROWN S

DW  930196011   ENERGY DEPT                          36,400    UPTON             NY  FP08-22-83    A 830831       04-01-83  03-31-85   JF
                BROOKHAVEN NATIONAL LAB.     CCVN1A                                                               LEE, JEFFREY
          TITLE: EFFECTS OF FREQUENCY/DURATION/WATER DEPOSITION RATES OF SIMULATED ACIDIC PRECIPITATION ON YIELD&QUAL

DW  930222010   ENERGY DEPT                          65,000    OAK RIDGE         TN  FP07-13-83    A 830725       04-01-83  03-31-85   JF
                OAK RIDGE NATIONAL LAB       CCVN1A                                                               LEE, JEFFREY
          TITLE: INTERACTIVE EFFECTS OF GASEOUS POLLUTANTS & ACID RAIN ON CROPS

DW  930255010   AGRICULTURE DEPT,                   150,000    WASHINGTON        DC  F 01-28-83                   06-01-80  01-31-86   JH
  AD12F24900    OFFICE OF THE SECRETARY      A                                                                    E PRESTON
          TITLE: S E REGIONAL CROP LOSS ASSESSMENT PROJECT

DW  930255011   AGRICULTURE DEPT                     53,400    RALEIGH           NC  F 07-18-83    A 830726       06-01-80  01-31-86   JH
  AD12F24904                                 CDWA1A                                                               PRESTON, E.
          TITLE: S.E. REGIONAL CROP LOSS ASSESSMENT

DW  930255012   ARMY, DEPT OF                        27,872    WASHINGTON        DC  F 03-08-84                                        JH
                                             CDWA1A                                                               PRESTON,E
          TITLE: S.E. REGIONAL CROP LOSS ASSESSMENT PROJECT

DW  930280010   ENERGY DEPT,                        150,000    WASHINGTON        DC  F 11-24-80                   07-01-82  01-31-84   JF
  AD09F25444    REGION 8                     A                                                                    E PRESTON
          TITLE: CENTRAL STATES REGIONAL CROP LOSS ASSESSMENT PROJECT

DW  930280011   ENERGY DEPT                         150,000    ARGONNE           IL  F 07-25-83    A 830815       07-01-83  01-31-85   JF
  AD09F25445    ARGONNE NATIONAL LAB.        CDWA1A                                                               PRESTON, ERIC
          TITLE: CENTRAL STATES REGIONAL CROP LOSS ASSESSMENT PROJECT

DW  930281010   ENERGY DEPT,                        425,000    WASHINGTON        DC  F 11-08-80                   06-01-82  05-31-85   JH
  AD09F2A109    PACIFIC NORTHWEST LAB        A                                                                    N GLASS
          TITLE: EPA COLD CLIMATE RESEARCH AND DEVELOPMENT PROGRAM

DW  930281011   ENERGY DEPT                         450,000    WASHINGTON        DC  F 07-26-83                   09-01-80  05-31-85   JH
  AD09F2A109    BATTELLE NW NATIONAL LAB.    CDAN1A                                                               GLASS, N.
          TITLE: EPA COLD CLIMATE RESEARCH & DEVELOPMENT PROGRAM

DW  930282010   INTERIOR DEPT                        20,000    ALBANY            NY  FP07-22-83    A 830811       06-01-83  05-31-88   JH
                GEOLOGICAL SURVEY            CCVN1A                                                               POWERS, C.
          TITLE: MONITORING THE WATER QUALITY OF SIX STREAMS IN CATSKILL MOUNTAINS, NY
DW  930282011   INTERIOR, DEPT OF                    2_,000    ALBANY            DC  F 03-15-84    A 840402       06-01-83  05-31-88   JH
                                             M                                                                    POWERS,C
          TITLE: MONITORING THE WATER QUALITY OF SIX STREAMS IN THE CATSKILL MOUNTAINS, NEW YORK
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                                      REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                       FUNDS AWARDED  CITY             STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       GS
 OLD NUMBER     DEPARTMENT                   PRG ELMT       EPA LAB                                            EPA PROJ OFFICER
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DW  930283010   TENNESSEE VALLEY AUTHORIT      100,000      CHATTANOOGA       TN  FP07-22-83     A 830907      06-10-83  06-09-84   JH
                WATER QUALITY BRANCH         BFDB38         ERL/COR                                            POWERS, C.
          TITLE: EPISODIC CHANGES IN STREAM WATER QUALITY IN SIX WATERSHEDS IN SOUTHERN BLUE RIDGE PROVINCE

DW  930300010   INTERIOR DEPT                   20,000      HARRISBURG        PA  FP08-05-83     A 830823      07-01-83  06-30-88   JH
                GEOLOGICAL SURVEY            CCVN1A                                                            POWERS, C.
          TITLE: MONITORING EFFECTS OF ACID RAIN ON WATER QUALITY OF LAUREL RIDGE, SOMERSET COUNTY, PA.

DW  930301010   ENERGY DEPT.                    75,000      WASHINGTON        DC  FP09-21-83                   11-25-81  01-01-99   JH
  AD89F23220    AMES LAB                     A                                                                 KIRBY,M
          TITLE: DEVELOPMENT OF ANALYTICAL METHODOLOGY

DW  930301011   ENERGY DEPT                     12,000      AMES              IA  F 08-04-83     A 830824      10-01-80  09-30-85   JH
  AD89F2322     AMES LAB.                    CCVN1A                                                            KIRBY, M.
          TITLE: DEVELOPMENT OF ANALYTICAL METHODOLOGY

DW  930301012   ENERGY DEPT OF                  51,000      AMES              IA  F 01-25-84                   10-01-80  09-30-85   JH
                AMES LAB                     CCVN1A                                                            KIRBY,M
          TITLE: DEVELOPMENT OF ANALYTICAL METHODOLOGY

DW  930318011   INTERIOR DEPT                   11,897      COLUMBIA          MO  F 08-31-83     A 830928      06-01-83  09-30-83   JF
                FISH & WILDLIFE SERVICE/C    CCUL1A                                                            LARSEN, D. P.
          TITLE: COMPARE LABORATORY/FIELD TOXICOLOGICAL ASSESSMENT PROCEDURES: EFFECT OF FLUORENE ON SEMI-NATURAL PON

DW  930321010   INTERIOR DEPT                   20,000      RALEIGH           NC  FP07-29-83     A 830824      07-01-84  06-30-88   PB
                GEOLOGICAL SURVEY            CCVN1A                                                            POWERS, C.
          TITLE: MONITORING SENSITIVITY OF STREAMS IN SANDHILLS REGION OF NC TO ACID DEPOSITION

DW  930321011   INTERIOR, DEPT OF               25,000      RALEIGH           DC  F 03-21-84                   07-01-84  06-30-88   PB
                                             CCVN1A                                                            POWERS,C
          TITLE: MONITORING THE SENSITIVITY OF STREAM IN THE SANDHILL REGION OF NORTH CAROLINA TO ACID DEPOSITION

DW  930324010   TENNESSEE VALLEY AUTHORIT       30,040      MUSCLE SHOALS     AL  FP08-16-83     A 830923      05-01-83  09-30-84   JH
                                             CCVN1A                                                            LACKEY, R.
          TITLE: RESPONSE OF SMALLMOUTH BASS TO PH DEPENDENT WATER QUALITY PERTURBATIONS
DW  930337010   TENNESSEE VALLEY AUTHORIT       20,000      WASHINGTON        DC  F 02-03-83     A 830928      09-28-82  09-30-83   JH
  AD64F2A323    IMMEDIATE OFFICE             A                                                                 C POWERS
          TITLE: ACID-SNSTVTY OF SLCTD RESERVOIRS IN TENNESSEE VALLEY REGION

DW  930337011   TENNESSEE VALLEY AUTH           30,000      WASHINGTON        TN  F 08-25-83                   10-01-82  09-30-87   JH
  AD64F2A323    WATER QUALITY BR             CCVN1A                                                            POWERS, C.
          TITLE: ACID-SENSITIVITY OF SELECTED RESERVOIRS IN TENNESSEE VALLEY REGION

DW  930493010   NAT'L OCEANIC & ATMOS. AD       70,000      ROCKVILLE         MO  FP11-23-83     A 831206      12-09-83  12-08-84   PB
                OAR MGMT & BUDGET            CCML1A                                                            GLASS,N
          TITLE: EFFECTS OF UV-B ON ZOOPLANKTON
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                                            GRANTS INFORMATION & CONTROL SYSTEM

                                    REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                         FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD      GS
  OLD NUMBER    DEPARTMENT                        PRG ELMT    EPA LAB                                            EPA PROJ OFFICER
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DW  930535011   ENERGY DEPT                         54,000    RICHLAND         WA  F 11-25-83    A 831212       10-02-83  03-31-86  JF
  AD89FA114     BATTELLE PACIFIC N.W. LAB    CDWA1A           EHL/COR                                          PRESTON,E
          TITLE: STATISTICAL AND BIOMATHEMATICAL ASSIST. ON NETWORK BICMONITORING USING HONEY BEES

DW  930550011   ENERGY DEPT                         70,000    RICHLAND         WA  F 12-20-83    A 840104       05-01-82  09-30-84  MJ
  AD89F2A160    BATTELLE MEMORIAL LAB        CBHD1A                                                            MILLER,W
          TITLE: FIELD ASSESSMENT OF INDIGENOUS BIOTA IN A SEMI-ARID HIGH PLAINS ECOREGIAN

DW  930573011   ENERGY DEPT                                   RICHLAND         WA  F 12-08-83    A 840117       12-01-83  06-30-84  MJ
  AD89F2A115    BATTELLLE PACIFIC N.W. LA    TFAY9A                                                            RANIERE,L
          TITLE: PREPARATION OF SUPERFUND TECHNICAL RESOURCE DOCUMENTS

DW  930695010   INTERIOR, DEPT OF                   25,530                     DC  FP03-16-84                   03-01-84  02-28-89  PB
                                             CCVN1A                                                            POWERS,C
          TITLE: LONG-TERM CHEMICAL AND BIOLOGICAL MONITORING AT MAINE LAKE
DW  930699011   ENERGY, DEPT OF                    400,000    WASHINGTON       DC  F 03-01-84    A 840321                           MJ
                                             M                                                                 MCCARTHY
          TITLE: EPA COLD CLIMATE RESEARCH AND DEVELOPMENT PROGRAM

DW  930705010   AGRICULTURE, DEPT OF                18,673    DULUTH           MN  FP02-02-84    A 840321       10-01-83  09-30-84  MJ
                FOREST SERVICE               CCVN1A                                                            POWEPS,C
          TITLE: COOPERATIVE INSTALLATION/OPERATION OF THE FERNBERG (MN) AND SAULT STE. MARIE DISTRICT (MI )

DW  930709010   ENERGY, DEPT OF                      1,309                     WA  FP03-07-84    A 840328       03-01-84  09-30-85  MJ
                BATTELLE PACIFIC NW LAB      TEKY1A                                                            RANIER,L
          TITLE: PREPARATION OF SUPERFUND TECHNICAL RESOURCE DOCUMENTS!

                                                 3,563,241
                                                        43

RW  930210010   AGRICULTURE DEPT.                    1,000 .  WASHINGTON       DC  F 01-28-83                   10-01-81  09-30-82  PB
  AR12F20480    OFFICE OF THE SECRETARY      X6EH10                                                             T MURPHY
          TITLE: PREPARE APPROXIMATELY 100 SAMPLES FOR ANALYSIS IN FY 82

RW  930210011   AGRICULTURE DEPT                     4,500    PORTLAND         OR  F 08-02-83                   10-01-82  09-30-85  PB
  AR12F3480     PACIFIC NW FOREST & RANGE    X6EH10                                                            KIBBY, H.
          TITLE: CHEMICAL ANALYSIS OF WATER SAMPLES

RW  930290010   INTERIOR DEPT                       39,000    DENVER           CO  FP08-01-83    A 830520       09-07-82  09-30-87  JR
                NATIONAL PARK SERVICE        X6EH10                                                            TINGEY, D.
          TITLE: SOUTHERN FLORIDA SLASH PINE STUDY

RW  930320010   ARMY DEPT.                          60,000    WASHINGTON       DC  F 02-01-83                   06-15-82  12-31-83  JR
  AR21F2A217    OFFICE CHIEF OF ENGINEERS    X6EH10                                                             N THOMAS
          TITLE: ENVIRONMENT FATE OF PENTACHLOROPHENOL IN OUTDOOR EXPERIMENT CH

                                                   144,500
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                                                 3,707,741
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                                   GRANTS INFORMATION & CONTROL SYSTEM

                             REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER     AGENCY                           FUNDS AWARDED  CITY            STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       GS
  OLD NUMBER   DEPARTMENT                         PRG ELMT     EPA LAB                                            EPA PROJ OFFICER
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DW  930023010  INTERIOR/FISH & WILDLIFE             40,000     COLUMBIA        MO  FP04-12-83      A 830415       10-01-82  09-30-84   PB
  AD14F3A214   COLUMBIA NATIONAL FISHERI          CATB1A       ERL/DUL                                             MULLIN, M.
            TITLE: ATMOSHPERIC TRANSPORT OF TOXAPHENE INTO GREAT LAKES

DW  930206010  INTERIOR DEPT.                       21,000     WASHINGTON      DC  F 04-08-82                     07-01-82  09-30-82   PB
  AD14F24190   U S FISH AND WILDLIFE SER    A                                                                       W SWAIN
            TITLE: PROVIDE SCIENTIFIC & ADMINISTRATIVE EXPERTISE ON WATER POLLUTION

DW  930206020  INTERIOR DEPT.                       22,000     WASHINGTON      DC  F 08-04-82                     10-01-80  09-30-81   PB
  AD14F14190   U S FISH AND WILDLIFE SER    A                                                                       W SWAIN
            TITLE: PROVIDE SCIENTIFIC EXPERTISE TO EPA

DW  930206030  INTERIOR DEPT                        20,000     COLUMBIA        MO  FP06-17-83      A 830629       07-01-83  06-30-84   PM
  AD14F24190   FISH & WILDLIFE SERVICE            CATB1A                                                           RUSSO, R.
            TITLE: IMPLEMENTATION OF AREA II OF THE US-USSR ENVIRONMENT AGREEMENT

DW  930294010  INTERIOR DEPT                         7,000     BOZEMAN         MT  FP08-17-83      A 830831       08-01-83  07-31-84   JF
               FISH & WILDLIFE SERVICE            CATB1A                                                           HERMANUTZ, R.
            TITLE: HISTOLOGICAL EFFECTS OF TOXICANTS ON FISHES

DW  930365010  ENERGY DEPT.                         60,000     WASHINGTON      DC  F 11-08-80      A 831108       08-01-82  12-31-83   JF
  AD89F2A215   ARGONNE NATIONAL LAB               CATB1A                                                            M MULLIN
            TITLE: ATMOSPHERIC POLLUTANT DRY DEPOSIT VELOCITIES OF LAKE MICHIGAN

                                                   170,000
                                                         6
RW  930149010  MICHIGAN, STATE OF                    6,720     LANSING         MI  FP05-25-83                     01-01-83  09-30-83   PB
               DEPT OF MGMT & BUDGET/STE          X6EM10                                                           FREEMAN, F.
            TITLE: LEASE AGREEMENT

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                                                   176,720
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                                          GRANTS INFORMATION & CONTROL SYSTEM

                                  REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER        AGENCY                        FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD        GS
  OLD NUMBER      DEPARTMENT                      PRG ELMT     EPA LAB                                            EPA PROJ OFFICER
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RW  930138010     AIR FORCE                           20,000   TYNDALL          FL  F 02-01-83                    11-01-82  09-30-83   JH
  AR57F3A016                                      X6EM10       ERL/GB                                              BOURQUIN,A
          TITLE: STUDY BIOLOGICAL DEGRADATION OF AF HYDROCARBON FUELS

RW  930138011     AIR FORCE                           10,000   TYNDALL          FL  F 05-16-83   A 830429         01-12-83  09-30-63   JH
  AR57F3A016      AIR FORCE                       X6EM10                                                           BOURQUIN,A
          TITLE: STUDY OF BIOLOGICAL DEGRADATION OF AF HYDROCARBON FUELS

RW  930138012     AIR FORCE DEPT OF                   30,000   LYNDALL          FL  F 11-22-83   A 831114         01-12-81  09-30-84   JH
                  HQ AFESC/RDXP                   R                                                                BORISQUIN
          TITLE: STUDY OF BIOLOGICAL DEGRADATION OF AF HYDROCARBON FUELS

RW  930138013     AIR FORCE DEPT OF                   20,000   THYNDALL AFB     FL  F 12-13-83   A 831130         01-12-81  09-30-84   JH
                  HQ AIR FORCE (AFESC/RDXP)       R                                                                BOURQUIN
          TITLE: STUDY OF BIOLOGICAL DEGRADATION OF AF HYDROCARBON FUELS

RW  930142010     INTERIOR DEPT.                      15,000   RESTON           VA  FP09-06-83                    04-01-83  03-31-84   JF
                  MINERALS MANAGEMENT SERVI       X6EM10                                                           DUKE, THOMAS
          TITLE: SECOND ADAPTIVE ENVIRONMENTAL ASSESSMENT WORKSHOP ON DRILLING MUDS

RW  930305010     ARMY                                75,000   FREDERICK        MD  FP08-02-83   A 830902         09-01-83  09-01-85   JH
                  ARMY MEDICAL RES & DEV CO       X6EM10                                                           COUCH, J.
          TITLE: CHEMICAL/ULTRASTRUCT CHARACTER LESIONS FISHES EXPOSED KNOWN CARCINOGENS W/EMPHASIS NEOPLASTIC DEVEL

RW  930305011     ARMY DEPT OF                        35,000   FREDRICK         MD  F 12-20-83   A 831205         09-01-83  09-01-85   JH
                  MEDICAL R&D COMMAND             R                                                                COUCH,J
          TITLE: HISTOLOGICAL, HISTOCHEMICAL, AND ULTRASTRUCTURAL CHARACTERIZATION OF LESIONS IN FISH
                                                     205,000
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                                                     205,000
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                                          REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER       AGENCY                       FUNDS AWARDED  CITY             STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD     GS
  OLD NUMBER     DEPARTMENT                     PRG ELMT     EPA LAB                                             EPA PROJ OFFICER
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DW  930184010    COMMERCE DEPT.                   118,700    WASHINGTON        DC  F 04-08-82                    04-01-82  03-01-84  JF
  AD13F2A162     NATIONAL OCEANIC&ATMOSPHE   A               ERL/NARR                                            R LATIMER
          TITLE: SITE CHARACTERIZATION STUDIES FOR THREE OCEAN DISPOSAL SITES

DW  930184011    COMMERCE DEPT                    215,000    WOODS HOLE        MA  F 07-01-83                    06-30-83  09-30-84  JF
  AD13F2A162     NATIONAL OCEANIC & ATMOSP   B49820                                                              LATIMER, R. W.
          TITLE: SITE CHARACTERIZATION STUDIES FOR TWO OCEAN DISPOSAL SITES

                                                  333,700
                                                        2

RW  930009010    ARMY CORPS OF ENGRS              577,000    WASHINGTON        DC  FP03-04-83    A 830527        02-14-83  02-14-84  JR
                                             X6EM10                                                              RECK, ALLAN
          TITLE:

RW  930009012    U.S. ARMY CORPS OF ENG           449,000    VICKSBURG         MS  F 02-07-84    A 831205        04-06-82  09-30-86  JR
                 WATERWAYS EXPER STATION     H                                                                   RECK,A
          TITLE: DREDGED MATERIALS DISPOSAL RESEARCH

RW  930212010    COMMERCE DEPT.                   578,000    WASHINGTON        DC  F 02-01-83                    10-01-81  09-30-82  JR
  AR13F28280     NATIONAL OCEANIC&ATMOSPHE   X6EM10                                                              P PAYNE
          TITLE: EFFECTS OF POLLUTION ON FISH & OTHER PRINCIPAL MARINE COMPNTS
RW  930212011    COMMERCE DEPT                    218,600    NARRAGANSETT      RI  F 06-23-83    A 821001        08-12-81  09-30-84  JR
  AR13F28280     NATIONAL OCEANIC & ATMOSP   X6EM10                                                              PAYNE, ROBERT
          TITLE: JOINT RES PROGRAM FOR INVESTIGATION OF EFFECTS OF POLLUTION ON PRINCIPAL MARINE ECOSYSTEM COMPONENTS

RW  930212012    COMMERCE DEPT OF                 146,800    NARRAGANSETT      RI  F 04-02-84    A 840224        08-12-81  09-30-84  JR
                 NAT'L OCEANIC ATMOSPHERIC   X6EM10                                                              PAYNE,R
          TITLE: JOINT RESEARCH PROGRAM FOR THE INVESTIGATION OF THE EFFECTS OF POLLUTION ON MARINE ECOSYSTEM

                                                1,969,400
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                                                2,303,100
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                                  REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER       AGENCY                          FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CD/DT   PROJECT PERIOD        GS
 OLD NUMBER      DEPARTMENT                         PRG ELMT    EPA LAB                                            EPA PROJ OFFICER
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DW  930021010    COMMERCE DEPT                       60,000     OAK RIDGE        TN  FP02-17-83     A 830622       04-01-83  04-01-84    JR
  AD13F3A453     NATIONAL OCEANIC & ATMOSP      CDTAID          ESRL/RTP                                            SHREFFLER, J.
            TITLE: URBAN PARTICULATE MODEL EVALUATION

DW  930021011    COMMERCE DEPT OF                    60,000     OAK RIDGE        TN  F 12-13-83     A 831223       04-01-83  04-01-85    JR
                 ATMOSPHERIC TURBULENCE &       CDTAID                                                              SHREFFLER,J
            TITLE: URBAN PARTICULATE MODEL EVALUATION

DW  930026010    GENERAL SERVICES ADMIN             635,000     WASHINGTON       DC  F 10-20-82                    10-01-81  09-30-83    JR
  AD47F25500     OFFICE OF ADMINISTRATOR        CDWA1A                                                              R BROWNING
            TITLE: ADP TECHNICAL ANALYSES AND PROGRAMMING SERVICES

DW  930026011    GENERAL SERVICES ADMIN.            853,917     WASHINGTON       DC  FP03-21-83     A 830325                             JR
  AD47F25500                                    CDWA1A                                                              BROWNING, BOB
            TITLE: ADP TECHNICAL ANALYSIS AND PROGRAMMING SERVICES

DW  930033010    COMMERCE DEPT                      200,000     IDAHO FALLS      IO  FP03-21-83     A 830420       01-30-83  06-30-84    PB
                 NATIONAL OCEANIC & ATMOSP      CCVN1A                                                              CLARKF  JOHN
            TITLE: REGIONAL SCALE TRANSPORT STUDIES WITH CAPTEX

DW  930036010    COMMERCE DEPT.                      15,000     WASHINGTON       DC  F 03-13-82                    10-01-82  09-30-83    JR
  AD13F24800     OFFICE OF THE SECRETARY        A                                                                   A ELLISON
            TITLE: METEOROLOGICAL SUPPORT TO THE ENVIRONMENTAL PROTECTION AGCY
DW  930036011    COMMERCE DEPT.                   2,656,400     BOULDER          CO  FP03-02-83     A 830420       10-01-82  09-30-83    JR
  AD13F34800     NATIONAL OCEANIC & ATMOSP      CDTAID                                                              ELLISON, A.
            TITLE: METEOROLOGICAL SUPPORT TO EPA

DW  930059010    ENERGY DEPT.                     1,255,000     WASHINGTON       DC  FP03-01-83     A 830422       10-01-82  09-30-86    PB
                                                D                                                                   DURHAM, JACK
            TITLE: PRECIPITATION SCAVENGING MODULE DEVELOPMENT

DW  930059012    ENERGY DEPT OF                   1,436,000     RICHLAND         WA  F 02-09-84     A 840306       10-01-82  09-30-86    PB
                 RICHLAND OPERATIONS OFFIC      CCVN1A                                                              BINKOWSKI,F
            TITLE: PRECIPITATION SCAVENGING MODULE DEVELOPMENT

DW  930060010    ENERGY DEPT.                       470,000     ARGONNE          IL  FP03-01-83     A 830506       10-01-82  09-30-85    PB
  AD89F3A456     ARGONNE NATIONAL LAB           CCVN1A                                                              CHING, JASON
            TITLE: ACID DEPOSITION TRANSPORT AND MODELING PROGRAM

DW  930067012    ENERGY DEPT OF                     420,000     UPTON            NY  F 02-02-84                    10-01-82  09-30-85    JR
                 BOOKHAVEN NAT'L LAB            CCVN1A                                                              BINKOWSKI,F
            TITLE: SUPPORT FOR ACID RAIN MODELING

DW  930069010    ENERGY DEPT.                       135,000     WASHINGTON       DC  F 04-01-83     A 830502       03-01-83  02-28-88    JR
                 ARGONNE NATIONAL LAB.          A                                                                   SPEER,RONALD
            TITLE: POLLUTANT DRY DEPOSITION MONITORING AND PARAMETERIZATION
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IAG NUMBER     AGENCY                          FUNDS AWARDED  CITY              STATE STATUS CO/DT   ACCEPT CO/DT   PROJECT PERIOD       GS
 OLD NUMBER    DEPARTMENT                        PRG ELMT     EPA LAB                                                EPA PROJ OFFICER
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DW  930073010  COMMERCE DEPT                        172,000   BOULDER             CO  FP03-02-83    A 830420     03-01-83  02-28-88   JW
               NATIONAL OCEANIC & ATMOSP     CCVNIA           ESRL/MTP                                            ELLESTAD, T.
          TITLE: RESEARCH & DEVELOPMENT OF METHODS FOR DRY DEPOSITION MEASUREMENT & MONITORING

DW  930073011  COMMERCE DEPT                         65,000   BOULDER             CO  F 08-22-83                 08-01-83  07-31-85   JW
               NATIONAL OCEANIC & ATMOSP     CCVNIA                                                               ELLESTAD, T.
          TITLE: RESEARCH & DEVELOPMENT OF METHODS FOR DRY DEPOSITION MEASUREMENT & MONITORING

DW  930089010  ENERGY DEPT.                          50,000   WASHINGTON          DC  FP03-18-83    A 830512     03-01-83  02-28-85   JF
  AD89F30970                                 CDTAID                                                               HURER, ALAN
          TITLE: GREEN RIVER AMBIENT MODEL ASSESSMENT

DW  930089011  ENERGY DEPT                           50,000   WASHINGTON          DC  F 04-14-83    A 830504     03-01-83  02-28-85   JF
  AD89F30970   OFFICE OF ENERGY RESEARCH     CDTAID                                                               HURER, AL.
          TITLE: GREEN RIVER AMBIENT MODEL ASSESSMENT

DW  930094011  ENERGY DEPT.                         150,000   WASHINGTON          DC  F 12-21-83    A 840220                          JW
  AD89F30970                                 B                                                                    HURER, ALAN
          TITLE: GREEN RIVER AMBIENT MODEL ASSESSMENT

DW  930129010  EFFECTS OF ACID DEPOSITIO             86,000   WASHINGTON          DC  F 02-01-83                 10-01-80  09-30-83   JW
  AD14F14520   BUREAU OF MINES               A                                                                    SPENCE,J
          TITLE: EFFECTS OF ACID DEPOSITION ON THE CORROSION OF STUCT MATERIALS

DW  930129011  INTERIOR DEPT.                        80,000   AVONDALE            MD  F 04-28-83                 10-01-80  09-30-83   JW
  AD14F2452    BUREAU OF MINES               CCVNIA                                                               SPENCE,J
          TITLE: EFFECTS OF ACIDIC DEPOSITION ON CORROSION OF STRUCTURAL MATERIALS IN ATMOSPHERE

DW  930144010  NATIONAL SCIENCE FDN.                510,000   WASHINGTON          DC  FP05-25-83    A 830617     05-01-83  01-31-87   PW
               NATIONAL CENTER FOR ATMOS     CCVNIA                                                               SHREFFLER, J.
          TITLE: DEVELOPMENT OF AN EULERIAN REGIONAL ACID DEPOSITION MODELING SYSTEM

DW  930144011  NATIONAL ACIENCE FOUNDATI            326,300   WASHINGTON          DC  F 09-19-83    A 830922     05-01-83  01-31-87   PB
               NATIONAL CTR FOR ATMOSPHE     CCVNIA                                                               SHREFFLER, J
          TITLE: DEVELOPMENT OF AN EULERIAN REGIONAL ACID DEPOSITION MODELING SYSTEM

DW  930193010  ENERGY DEPT.                         110,000   WASHINGTON          DC  F 10-25-83                 08-01-82  01-31-84   JW
  AD89F2A216   PACIFIC NORTHWEST LAB         A                                                                    L CUPITT
          TITLE: HZRDS AIR POLLUTANTS: DRY DEPOSITION PHENOMENA (300A01969)

DW  930193011  ENERGY DEPT                           17,500   WASHINGTON          DC  F 06-15-83    A 830711     08-01-82  01-31-84   JR
  AD89F2A216   BATTELLE MEMORIAL INSTITU     COTAIB                                                               CUPITT, L.
          TITLE: HAZARDOUS AIR POLLUTION: DRY DEPOSITION PHENOMENA

DW  930197010  ENERGY DEPT.                         100,000   WASHINGTON          DC  F 02-01-83                 08-01-82  10-31-83   JW
  AD89F2A243   PACIFIC NORTHWEST LAB         A                                                                    L CUPITT
          TITLE: HZRDS ATOMSPHERIC PLTNTS WET RMVL RATES & MECHANISM 300A01947
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                                 REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                      FUNDS AWARDED  CITY            STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD      GS
  OLD NUMBER    DEPARTMENT                     PRG ELMT    EPA LAB                                            EPA PROJ OFFICER
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DW  930197011   ENERGY DEPT                      7,500     RICHLAND         WA  F 06-13-83    A 830711     08-01-83  10-31-83   JH
  AD89F2A243    BATTELLE MEMORIAL INST/PA   C9TA1B         ESRL/RTP                                         CUPITT, LARRY
           TITLE: HAZARDOUS ATMOSPHERIC POLLUTANTS: WET REMOVAL RATES & MECHANISMS

DW  930214010   ENERGY DEPT                    225,000     ALBUQUERQUE      NM  FP06-17-83    A 830823     09-01-83  09-01-85   JH
                SANDIA NATIONAL LAB.        CDTA1D                                                          IRWIN, JOHN
           TITLE: VARIABLE BUOYANCY BALLOON TRACER OF ATMOSPHERIC MOTION

DW  930237010   NATIONAL SCIENCE FDN.           76,900     BOULDER          CO  FP07-11-83    A 830804     08-01-83  07-31-84   JF
                NATIONAL CENTER FOR ATMOS   CCVN1A                                                          DODGE, M.
           TITLE: CHEMICAL TRANSFORMATION MODULES FOR EULERIAN ACID DEPOSITION MODEL

DW  930256010   ENERGY DEPT                    200,000     UPTON            NY  FP07-13-83    A 830726     08-01-83  07-31-84   PM
                BROOKHAVEN NATIONAL LAB.    CCVN1A                                                          DODGE, M.
           TITLE: CHEMICAL TRANSFORMATIONS IN ACID RAIN

DW  930261010   COMMERCE DEPT.                 120,000     WASHINGTON       DC  F 09-27-82                 02-01-82  12-31-83   JF
  AD13F2A059    NATIONAL OCEANIC&ATMOSPHE   A                                                               P FINKELSTEIN
           TITLE: ON SITES MTRLGCL INSTRMNTTN MEURMNTS FOR CHRCTRZNG DISPRSN

DW  930261011   COMMERCE DEPT                   25,000     BOULDER          CO  F 07-21-83    A 830901     02-01-82  06-30-84   JF
  AD13F2A059    NATIONAL OCEANIC & ATMOSP   CDTA1D                                                          FINKELSTEIN, P
           TITLE: METEOROLOGICAL TURBULENCE MEASUREMENT & ANALYSIS

DW  930262010   COMMERCE DEPT                   30,000     WASHINGTON       DC  FP07-21-83                 07-01-83  04-30-85   JF
                NATIONAL BUREAU OF STANDA   CCVN1A                                                          HAYNIE, FRED
           TITLE: LIFE CYCLE COSTS
DW  930262011   COMMERCE, DEPT OF               60,000     WASHINGTON       DC  F 04-04-84                 07-01-83  04-30-85   JF
                NAT'L BUREAU OF STANDARDS   CCVN1A                                                          HAYNE,F
           TITLE: LIFE CYCLE COSTS
DW  930264010   INTERIOR DEPT                   15,000     DENVER           CO  FP07-13-83    A 830722     06-30-83  07-01-84   JH
                GEOLOGICAL SURVEY           CCVN1A                                                          SPENCE, JOHN
           TITLE: CORROSION OF BUILDING STONE
DW  930284010   ARMY CORPS OF ENGRS             40,500     HANOVER          NH  FP07-15-83    A 830812     07-01-83  12-31-84   PM
                COLD REGIONS RES. LAB.      CCVN1A                                                          BERHARD, JON
           TITLE: DETERMINATION OF MATERIALS DISTRIBUTION COEFFICIENTS

DW  930302010   COMMERCE DEPT                  120,000     BOULDER          CO  FP07-18-83    A 830830     07-01-83  10-30-84   JH
                NATIONAL OCEANIC & ATMOSP   CDTA1D                                                          SNYDER, W.
           TITLE: VORTEX FORMATION ON UPWIND HILL SLOPES

DW  930306010   TENNESSEE VALLEY AUTHORIT       60,000     WASHINGTON       DC  F 11-15-80                 05-01-82  06-15-83   JH
  AD64F2A180    IMMEDIATE OFFICE            A                                                               M BARNES
           TITLE: S O 2  PHOTOCHEMICAL OXIDATION MODULE DEVELOPMENT
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                                REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY
  OLD NUMBER    DEPARTMENT                 FUNDS AWARDED  CITY         STATE STATUS CO/DT  ACCEPT CO/DT  PROJECT PERIOD       GS
                                           PRO ELMT       EPA LAB                                        EPA PROJ OFFICER
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DW  930306011   TENNESSEE VALLEY AUTHORIT       39,436    OAK RIDGE     TN  F 08-04-83    A 830923      10-02-82  09-30-74   JH
  AD64F2A180                               CDTAID         ESRL/RTP                                       BARNES, M.
           TITLE: SO2 PHOTOCHEMICAL OXIDATION MODULE DEVELOPMENT
DW  930319010   NATIONAL SCIENCE FOUNDATI       96,000    WASHINGTON    DC  F 06-28-82
  AD49F2A231    IMMEDIATE OFFICE             A                                                           08-01-83  12-31-83   JH
           TITLE: PHOTOCHEMICAL PROCESSES SELECTED HAZARDOUS AIR POLLUTANTS                                J RUFALINI

DW  930319011   NATIONAL SCIENCE FDN            33,300    WASHINGTON    DC  F 08-16-83    A 830916      08-01-83  12-31-83   JH
  AD49F2A231                               CDTAID                                                        RUFALINI, J.
           TITLE: PRIMARY PHOTOCHEMICAL PROCESSES IN SELECTED HAZARDOUS AIR POLLUTANTS (HAPS)
DW  930338010   INTERIOR, DEPT. OF              50,000    WASHINGTON    DC  FP09-09-83
                NATIONAL PARK SERVICE      CCVNIA                                                        09-01-83  08-30-85   JF
           TITLE: RETROSPECTIVE MATERIALS DAMAGE FUNCTION                                                 SPENCE, J

DW  930338011   INTERIOR, DEPT OF               50,000    WASHINGTON    DC  F 04-03-84
                NAT'L PARK SERV            CCVNIA                                                        09-01-83  08-30-85   JF
           TITLE: RETROSPECTIVE MATERIALS DAMAGE FUNCTION                                                 SPENCE,J

DW  930348010   ENERGY DEPT.                    99,900    WASHINGTON    DC  F 02-01-83
  AD89F2A069    OFFICE OF THE SECRETARY      A                                                           02-01-82  09-30-83   JH
           TITLE: OPTIMIZATION & ANALYSIS OF REGIONAL PHOTOCHEMICAL MODEL PERFRM                          J NOVAK
DW  930348011   ENERGY DEPT                    156,514    ALBUQUERQUE   NM  F 09-02-83    A 830921      10-01-82  09-30-85   JH
  AD89F2A069    LOS ALAMOS NATIONAL LAB.   CDWAIA                                                        NOVAK, JOAN
           TITLE: OPTIMIZATION & ANALYSIS OF REGIONAL PHOTOCHEMICAL MODEL PERFORMANCE
DW  930361010   COMMERCE DEPT                  400,000    WASHINGTON    DC  FP09-20-83    A 830928      10-01-82  09-30-83   JH
                NATIONAL OCEANIC & ATMOSP  CDTAID                                                        SCHIERMEIER, F
           TITLE: FIELD MEASUREMENTS IN SUPPORT OF COMPLEX TERRAIN MODELING

DW  930658010   COMMERCE, DEPT OF              120,000                  DC  FP03-09-84
                                           CDTAID                                                        01-01-84  01-01-85   JF
           TITLE: TRACER EXPERIMENTS FOR AIR QUALITY MODEL VERIFICATION                                   CLARKE,J

DW  930701010   COMMERCE, DEPT OF              300,000    BOULDER       CO  FP03-05-84
                NOAA WAVE PROPAGATION      CDTAID                                                        10-01-83  09-30-86   MJ
           TITLE: LIDAR MEASUREMENTS IN SUPPORT OF COMPLEX TERRAIN MODEL DEVELOPMENT                      HOLZWORTH,G

DW  930710010   ENERGY, DEPT OF                 40,000    UPTON         NY  FP03-07-84    A 840328      12-01-83  11-30-84   MJ
                BROOKHAVEN NATIONAL LAB      M                                                           SPENCE,J
           TITLE: EFFECTS OF ACID DEPOSITION ON THE PROPERTIES OF REINFORCED PORTLAND CEMENT CONCRETE STRUCTURES
                                        12,280,167
                                                47
RW  930340010   ARMY ENVHN HYGIENE AGENCY       15,000    ABERDEEN      MD  FP08-26-83
                                           X6EM10         ESRL/RTP                                       08-01-83  12-01-83   PB
           TITLE: PINON CANYON TRAINING AREA PARTICULATE MONITORING PROGRAM                               STEVENS, R. K.
RW  930346010   NATIONAL AERONAUTICS & SP        2,000    HAMPTON       WA  FP09-07-83    A 830610      06-16-83  09-31-83   PB
                NASA- LANGLEY RESEARCH CE  X6EM10                                                        HANST,PHILIP
           TITLE: NASA HALOE SCIENCE TEAM ACTIVITIES

                                            17,000
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                                        12,297,167
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                                      REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                          FUNDS AWARDED  CITY           STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD      GS
 OLD NUMBER     DEPARTMENT                         PRG ELMT    EPA LAB                                           EPA PROJ OFFICER
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DW  930215010    ENERGY DEPT.                          291,021    WASHINGTON       DC  F 11-08-80                  10-01-81  01-31-84   JF
  AD89F2A051     OAK RIDGE NATIONAL LABORA   A                    HERL/CIN                                          CRAUN, G.
           TITLE: EVALUATION OF CARDIOVASCULAR DISEASE & DRINKING WATER MINERALS IN WISCONSIN DAIRYMEN

DW  930215011    ENERGY DEPT                            51,095    OAK RIDGE        TN  F 06-15-83    A 830719     10-01-81  01-31-84   JF
  AD89F2A051     OAK RIDGE NATIONAL LAB,     CBMC1A                                                                CRAUN, G.
           TITLE: EVALUATION OF CARDIOVASCULAR DISEASE & DRINKING WATER MINERALS IN WISCONSIN DAIRYMEN

DW  930231010    ARMY                                   60,000    BETHESDA         MD  FP06-22-83    A 830705     07-15-82  10-31-85   JM
                 UNIFORMED SERVS, UNIV, HE   B2BL25                                                                SMITH, M, K,
           TITLE: EFFECTS OF TOXIC SUBSTANCE ON PITUITARY CELL CULTURES

DW  930252010    ENERGY DEPT.                          240,463    WASHINGTON       DC  F 02-01-83                  06-01-80  05-31-83   JM
  AD89F00460     LAWRENCE LIVERMORE LAB      A                                                                     M SMITH
           TITLE: CHEM INDUCED ABNORMALTIES IN MOUSE AND MAN

DW  930252011    ENERGY DEPT                            75,000    WASHINGTON       DC  F 07-07-83    A 830818     06-01-80  05-31-86   JM
  AD89F10460     LAWRENCE LIVERMORE LAB.     BJNL25                                                                SMITH, M, K,
           TITLE: CHROMOSOMAL ANEUPLOIDY & STRUCTURAL ABERRATIONS IN HUMAN SPERM USING VFF & HAMSTER EGG SYSTEMS
DW  930304010    INTERIOR DEPT.                         90,000    WASHINGTON       DC  F 02-01-83                  03-01-81  09-30-82   JM
  AD14F15590     U S GEOLOGICAL SURVEY       A                                                                     F KOPFLER
           TITLE: CHARACTERIZATION OF AQUATIC HUMIC SUBSTANCES

DW  930304011    INTERIOR DEPT                          31,500    DENVER           CO  F 08-02-83    A 830812     03-01-81  09-30-84   JM
  AD14F1559      GEOLOGICAL SURVEY           CBMC1A                                                                KOPFLER, F.
           TITLE: CHARACTERIZATION OF AQUATIC HUMIC SUBSTANCES FROM SELECTED RIVERS IN VARIOUS CLIMATIC REGIONS
DW  930304020    INTERIOR DEPT.                         85,000    WASHINGTON       DC  F 02-01-83                  03-01-82  09-30-82   JM
  AD14F25590     U S GEOLOGICAL SURVEY       A                                                                     F KOPFLER
           TITLE: CHRCTRZTN OF AQUATIC HUMIC SUSTANCES FROM SELECTED RIVERS
DW  930533011    ENERGY DEPT                           101,610    OAK RIDGE        TN  F 11-25-83    A 831213     11-01-83  04-30-84   PB
  AD89F2A051     OAK RIDGE OPERATIONS OFFI   CBMC1A                                                                CRAUN,G
           TITLE: EVALUATION OF CARDIOVASCULAR DISEASE & DRINKING WATER MINERALS IN WISCONSIN DAIRYMEN

DW  930607010    ENERGY DEPT                            98,500    DAVIS            CA  FP01-12-84    A 840326     12-01-83  02-28-85   MJ
                 UNIV. OF CALIF,DAVIS        CA01A                                                                 MILLER,F
           TITLE: DEPOSITION OF COARSE MODE AEROSOLS IN LAB ANIMALS

DW  930729010    ENERGY DEPT OF                         25,000                     DC  FP04-05-84    A 840405                          PB
                                             CBMC1A                                                                BULL,R
           TITLE: FIFTH CONFERENCE ON "WATER CHLORINATION: ENVIRONMENTAL IMPACT AND HEALTH EFFECT."

                                                     1,157,189
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                                  REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                        FUNDS AWARDED  CITY          STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD      GS
  OLD NUMBER    DEPARTMENT                      PRG ELMT     EPA LAB                                          EPA PROJ OFFICER
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DW  930183010   COMMERCE DEPT.                    320,000    WASHINGTON      DC  F 02-01-83                   01-15-81  01-14-89   JM
  AD13F2A043    OFFICE OF THE SECRETARY       A              HERL/RTP                                          G GOLDSTEIN
           TITLE: METHODOLOGY FOR NATIONAL ENVIRONMENTAL SPECIMEN BANK RSRCH

DW  930183011   COMMERCE DEPT.                    108,000    WASHINGTON      DC  F 06-13-83    A 830705       01-15-81  01-14-89   JM
  AD13F2A043    NATIONAL BUREAU OF STANDA     CCHM1A                                                           GOLDSTEIN, G.
           TITLE: EVALUATION & RESEARCH OF METHODOLOGY FOR NATIONAL ENVIRONMENTAL SPECIMEN BANK

DW  930183012   COMMERCE DEPT OF                  125,000    WASHINGTON      DC  F 02-23-84    A 840326       01-15-81  01-14-89   JM
                NAT'L BUREAU OF STANDARDS     CCHM1A                                                           GOLDSTEIN,G
           TITLE: EVALUATION AND RESEARCH OF METHODOLOGY FOR THE NATIONAL ENVIRONMENTAL SPECIMEN BANK

DW  930183013   COMMERCE, DEPT OF                  70,000    WASHINGTON      DC  F 03-28-84                   01-15-81  01-14-89   JM
                                              C9NA1B                                                           GOLDSTERN,G
           TITLE: EVALUATION AND RESEARCH OF METHODOLOGY FOR THE NATIONAL ENVIROMENTAL SPECIMAN BANK

DW  930216010   HEALTH & HUMAN SERVICES D          32,000    BETHESDA        MD  FP06-21-83    A 830823       07-01-83  06-30-84   JM
                NATIONAL INSTITUTES OF HE     CCAE1A                                                           CHERNOFF, NEIL
           TITLE: DETERMINATION OF EARLY EMBRYONIC LOSS IN WOMEN USING THE B HCG ANALYSIS METHOD

DW  930217010   ENERGY DEPT                        97,000    ARGONNE         IL  FP06-21-83    A 830718       07-01-83  06-30-84   JM
                ARGONNE NATIONAL LAB          X6NL2D                                                           NESNOW, S.
           TITLE: DEVELOP/USE HUMAN CELL CULTURE SYS PRESCREENING ENVRN CHEMICALS WHICH INITIATE/PROMOTE TUMOR GROWTH

DW  930263010   ENERGY DEPT                         5,000    BERKELEY        CA  FP07-21-83    A 830829       07-15-83  01-01-84   JF
                LAWRENCE BERKELEY LAB.        CCSL1A                                                           NELSON, W.
           TITLE: COMPUTER SCIENTIST SUPPORT FOR INSTALLATION & ACCESS TO SOCIO-ECONOMIC ENVRN DEMOGRAPHIC INFO SYS (S

DW  930307011   COMMERCE DEPT                      20,000    WASHINGTON      DC  F 07-20-83    A 830901       01-01-83  12-31-83   JR
  AD13F3535     NATIONAL BUREAU OF STANDA     CAFA1D                                                           HAUSER, T.
           TITLE: IMPROVE MEASUREMENT METHODS FOR CALIBRATION & DEVELOPMENT OF STANDARD REFERENCE MATERIALS

DW  930312010   HEALTH & HUMAN RESOURCES           65,300    WASHINGTON      DC  F 02-01-83                   03-31-82  03-30-85   JF
  AD75F2A151    NATIONAL INSTITUTES OF HE     A                                                                F DANIEL
           TITLE: CHRNC LONG-TERM CRCNGNSS BIOSSAY ORLLY ADMINISTERED CHLORAMINE

DW  930312011   HEALTH & HUMAN SERVICES D          61,500    BETHESDA        MD  F 09-02-83                   03-31-83  03-30-85   JF
  AD75F2A151    TOXICOLOGY RES/TESTING PR     CBMC1A                                                           DANIEL, F. B.
           TITLE: CHRONIC LONG-TERM CARCINOGENESIS BIOASSAY ON ORALLY ADMINISTERED CHLORAMINE
DW  930341010   ENERGY DEPT                         5,000    OAK RIDGE       TN  FP09-02-83                   09-01-83  10-30-83   JF
                OAK RIDGE NATIONAL LAB.       X6EH10                                                           WATERS, M.
           TITLE: DEVELOP AN INTEGRATED SCIENTIFIC INFORMATION SYSTEM FOR SORTING, ANALYZING & ACCESSING GENETIC TOXIC

DW  930576011   ENERGY DEPT                        60,000    RICHLAND        WA  F 12-09-83    A 840106       09-01-78  10-31-84   PB
  AD89F2A036    RICHLAND OPERATIONS           CA6A1D                                                           MILLER,F
           TITLE: TOXICITY IN ANIMALS OF FINE VS. COARSE MODE PARTICLES
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                                  REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                  FUNDS AWARDED CITY           STATE STATUS CO/DT  ACCEPT CO/DT  PROJECT PERIOD       05
  OLD NUMBER    DEPARTMENT                PRG ELMT    EPA LAB                                          EPA PROJ OFFICER
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OW  930654010   ENERGY, DEPT OF                 15,000   UPTON            NY  FP03-08-84   A 840328    10-01-83  12-31-84   PW
                BROOKHAVEN NAT'L LAB      CCSL1A      HERL/RTP                                          ALLEN,J
           TITLE: INTERNATIONAL SYMPOSIUM ON SISTER CHROMATID EXCHANGE: TWENTY-FIVE YEARS OF EXPERIMENTAL RESEARCH

                                               983,800
                                                    13

RW  930130010   NATIONAL INST ENVRN HEALT      170,000   RTP              NC  FP05-24-83   A 830317    03-31-83  03-30-86   PW
                PROCUREMENT OFFICE, DAM   X0EH10                                                        NESNOW, S.
           TITLE: COMPARATIVE METABOLIC ACTIVATION: SPECIES DIFFERENCES IN CARCINOGEN/MUTAGEN ACTIVITY

RW  930131010   NATIONAL INST OF ENVRN HE      470,760   RESEARCH TRIANGLE NC FP12-29-81               12-01-81  07-31-84   PW
  AW96F2A046                              X0EH10                                                        NESNOW, S.
           TITLE: CGT RAPID TEST RESPONSE

RW  930131011   NATIONAL INST OF ENVRN HE      563,000   RTP              NC  F 05-04-83               12-01-81  07-31-84   PW
  AW96F2A046    PROCUREMENT OFFICE, DAM   X0EH10                                                        NESNOW, S.
           TITLE: CGT RAPID TEST RESPONSE

RW  930133011   HEALTH & HUMAN SERV DEPT       150,000   ROCKVILLE        MD  F 04-29-83               08-03-78  09-30-83   JM
  AW75F24150    FOOD & DRUG ADMIN         X0EH10                                                        REITER, LARRY
           TITLE: NEUROTOXICOLOGY PROGRAMS

RW  930143010   DEFENSE DEPT/ARMY                        FORT DETRICK     MD  FP06-03-83               04-01-83  09-30-83   JM
                                          X0EH10                                                        LEWTAS, J.
           TITLE: MUTAGENESIS SCREENING OF RCRA RESIDUALS FROM DYE INDUSTRIES

RW  930143011   U.S. ARMY                        8,000   FREDERICK        MD  F 02-28-84               04-01-83  06-30-84   JM
                MEDICAL RESEARCH & DEVEL  X0EH10                                                        LEWTAS,J
           TITLE: MUTAGENESIS BIOASSAYS

RW  930143012   U.S. ARMY                                FREDERICK        MD  F 02-16-84   A 840213    04-01-83  06-30-84   JM
                MEDICAL RESEARCH & DEV    X0EH10                                                        LEWTAS,J
           TITLE: MUTAGENESIS BIOASSAYS

RW  930291010   DEFENSE DEPT                   125,000   FORT DETRICK     MD  FP07-22-83               08-20-81  09-30-83   JM
                ARMY R & D LAB.           H                                                             BENIGNUS, V.
           TITLE: NEUROBEHAVIORAL & PERFORMANCE EFFECTS OF CARBON MONOXIDE (CO) EXPOSURE IN HUMANS

RW  930291011   ARMY, DEPT OF                            FREDERICK        MD  F 03-07-84               06-01-83  05-31-88   JM
                MEDICAL RESEARCH & DEVEL. H                                                             BENIGNUS,V
           TITLE: NEUROBEHAVIORAL AND PERFORMANCE EFFECTS OF CARBON MONOXIDE (CO) EXPOSURE IN

RW  930352010   ARMY DEPT.                     250,000   WASHINGTON       DC  F 09-27-82               09-01-82  12-31-82   JM
  AR21F20590    OFFICE CHIEF OF ENGINEERS A                                                             M PETROVICK
           TITLE: HUMAN HLTH STUDIES OF CO UNDER COND OF MILITARY WEAPONS SYSTEM

RW  930352011   DEFENSE DEPT                    50,000   FREDERICK        MD  F 08-25-83   A 830816    08-20-81  08-19-86   JM
  AR21F20590    ARMY MEDICAL RESEARCH AND A              HERL/RTP                                       PETROVICK,M
           TITLE: HUMAN HEALTH STUDIES OF CO UNDER CONDITIONS OF MILITARY WEAPONS SYSTEM CREWMAN EXPOSURES
RW  930607010   ARMY DEPT.                   1,050,493   WASHINGTON       DC  FP09-27-83               08-31-81  08-31-85   JF
  AR21F20320    OFFICE CHIEF OF ENGINEERS X6EH10                                                        RAUB,J
           TITLE: INHALATION TOXICOLOGY OF FOG OIL OBSCURANT

                                             3,343,193
                                                    12
                                             4,326,993
                                                    25
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IAG NUMBER       AGENCY                        FUNDS AWARDED  CITY              STATE STATUS CO/DT   ACCEPT CO/DT   PROJECT PERIOD       GS
  OLD NUMBER     DEPARTMENT                      PRG ELMT     EPA LAB                                                EPA PROJ OFFICER
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DW  930179010    ENERGY DEPT                         9,900    WASHINGTON          DC  FP06-09-83    A 830826      05-15-83  09-15-83   JM
                 OAK RIDGE NATIONAL LAB.       CCZNIA         IERL/CIN                                             BLANEY, B.
           TITLE: ASSESSMENT OF DISTRICT HEATING MULTIMEDIA EMISSIONS

DW  930265010    ENERGY DEPT.                      250,000    WASHINGTON          DC  F 11-21-80                  11-01-81  11-30-82   JM
  ADB9F27680     OAK RIDGE OPERATIONS OFFI     A                                                                   L STALEY
           TITLE: ASSESSMENT OF HAZARDOUS WASTE AND VOC INCNRTN AND TREAT FACIL

DW  930265011    ENERGY DEPT                       100,000    WASHINGTON          DC  F 07-18-83    A 830808      07-01-83  09-30-84   JM
  ADB9F17061     OAK RIDGE NATIONAL LAB        CBMDIA                                                              BLANEY, B.
           TITLE: ASSESSMENT OF HAZARDOUS WASTE & VOC INCINERATION AND TREATMENT FACILITIES

                                                   359,900
                                                         3

RW  930161010    DEFENSE DEPT.                       5,500    BATTLE CREEK        MI  FP06-03-83    A 830616      03-15-83  09-30-83   JM
                 DEFENSE LOGISTICS AGENCY      ABEHID                                                              CAMPES, R.
           TITLE: RESULTS OF CONTROLLED AIR INCINERATION OF PENTACHLOROPHENOL TREATED AMMUNITION BOXES

RW  930586010    U.S. BUREAU OF MINES               20,000    WASHINGTON          DC  FP01-06-84    A 831202      11-01-83  05-01-84   MJ
                                               H                                                                   HOWELL,S
           TITLE: TREATMENT AND RECOVERY OF ELECTROCHEMICAL MACHINERY & ELECTRODISCHARGE MACHINING WASTES
RW  930647011    AIR FORCE, DEPT OF                230,000    TYNDALL AFB         FL  F 03-08-84                  01-01-83  01-01-85   MH
                 AIR FORCE HQ ENGINEERING      ABEHID                                                              WATKINS,H
           TITLE: DEGRADATION OF TOXIC/HAZARDOUS COMPOUNDS

                                                   255,500
                                                         3
                                                   615,400
                                                         6
                                   REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                                 FUNDS AWARDED  CITY             STATE STATUS CO/DT   ACCEPT CO/DT    PROJECT PERIOD        OS
  OLD NUMBER    DEPARTMENT                               PRG ELMT     EPA LAB                                               EPA PROJ OFFICER
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DW  930122010     ENERGY DEPT.                              25,000     UPTON              NY  FP05-19-83      A 830413     04-01-83  03-31-84   PW
                  BROOKHAVEN NATIONAL LAB.       CCVN1A                IERL/RTP                                            MORLEY, J. D.
            TITLE: UNCERTAINTY ANALYSIS OF NATIONAL ACID PRECIPITATION ASSESSMENT PROGRAMS EMISSION INVENTORY

DW  930354010     ENERGY DEPT                               50,000     ARGONNE            IL  FP09-20-83                   09-01-83  09-01-85   JF
                  ARGONNE NATIONAL LAB.          CCVN1A                                                                    MILLIKEN, J.
            TITLE: ANALYSIS OF FACTORS AFFECTING RETIREMENT OF MAJOR EMITTING FACILITIES

                                                            75,000
                                                                 2
RW  930153010     AIR FORCE                                100,000     LOS ANGELES        CA  FP09-23-82                   09-01-82  09-30-85   JF
  AR57F2A324      AIR FORCE SPACE DIVISION       X6EH10                                                                    STERN, R.
            TITLE: ASSESSMENT OF TECHNOLOGY FOR MANAGING POTENTIALLY TOXIC AND HAZARDOUS MATERIALS GENERATED BY SPACE L

RW  930153011     AIR FORCE                                700,000     LOS ANGELES        CA  F 05-27-83      A 830308     09-01-82  09-30-85   JF
  AR57F3A324      CHEMICAL SYSTEMS BRANCH        X6EH10                                                                    STERN, R.
            TITLE: ASSESS TECHNOLOGY/MANAGING POTENTIALLY TOXIC/HAZARDOUS MATERIALS GENERATED BY SPACE LAUNCH OPERATION
RW  930165010     NAVY DEPT.                                30,000     DAHLGREN           VA  FP06-03-83      A 830516     05-16-83  09-30-83   JF
                  NAVAL SURFACES WEAPONS CE      X6EH10                                                                    PLAKS, NORMAN
            TITLE: FABRIC FILTER EVALUATION AT NAB, LITTLE CREEK, VA.
RW  930173010     NAVY DEPT.                                25,000     DAHLGREN           VA  FP06-15-83      A 830509     07-01-83  12-31-83   JF
                  NAVAL SURFACE WEAPONS CEN      X6EH10                                                                    BRNA, T.
            TITLE: STATUS OF DRY SO2 CONTROL SYSTEMS: FALL 1983

RW  930175010     TRANSPORTATION DEPT.                      20,322     PORTSMOUTH         VA  FP06-03-83      A 830517     05-11-83  12-25-83   JF
                  COAST GUARD                    X6EH10                                                                    HARRIS, D. B.
            TITLE: STUDY TO DETERMINE ENVRN IMPACTS OF PROPOSED COAL TERMINAL

RW  930315011     ENERGY DEPT                              200,000     WASHINGTON         DC  F 08-03-83      A 830414     07-01-80  09-30-83   JM
  AR89F3A408      OFFICE OF ENVIRONMENTAL &      X6EH10                                                                    MOBLEY, D.
            TITLE: ASSESSMENT OF ADEQUACY OF ADVANCED ENVRN TECHNOLOGY FOR CONTROLLING NOX & SOX

                                                         1,075,322
                                                                 6
                                                         1,150,322
                                                                 8
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IAG NUMBER      AGENCY                        FUNDS AWARDED  CITY           STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD        GS
 OLD NUMBER     DEPARTMENT                      PRG ELMT     EPA LAB                                           EPA PROJ OFFICER
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DW  930066010   ARMY                             20,000     CHAMPAIGN         IL  FP02-23-83    A 830420      04-01-83  01-31-85    JM
                CONSTRUCTION ENGINEERING      CA2B1B        MERL/CIN                                           OPATKEN, E.
           TITLE: SECOND INTERNATIONAL CONFERENCE ONFIXED FILM BIOLOGICAL PROCESSES
DW  930074010   ENERGY DEPT.                    100,000     RICHLAND          WA  FP03-03-83    A 830504      03-01-83  08-31-85    JM
                                              CBRD1A                                                           HERRMANN, J.
           TITLE:

DW  930074011   ENERGY, DEPT OF                 100,000     RICHLAND          WA  FP03-05-84    A 840328      05-01-83  10-31-85    JM
                RICHLAND OPERATIONS            H                                                               HERMAN,J
           TITLE: PREDICTION OF FIELD CAPACITY OF LANDFILLS

DW  930146010   ARMY CORP OF ENGRS.             206,000     WASHINGTON        MS  FP05-24-83    A 830621      07-01-83  06-30-86    JM
                WATERWAYS EXPERIMENT STAT   D                                                                  WILES, CARLTON
           TITLE: EVALUATION OF FACTORS AFFECTING STABILIZATION/SOLIDIFICATION OF TOXIC & HAZARDOUS WASTE

DW  930162010   ARMY CORPS OF ENGRS              45,000     VICKSBURG         MS  FP06-08-83    A 830614      07-01-83  05-31-86    PB
                WATERWAYS EXPERIMENT STAT     TEJY1A                                                           SANNING, D.
           TITLE: ASSESSMENT OF GEOTECHNICAL ASPECTS AT UNCONTROLLED HAZARDOUS WASTE SITES

DW  930163010   NAVY                             20,000     COLTS NECK        NJ  FP05-27-83    A 830828      10-01-83  09-30-86    JF
                                              CBRD1A                                                           FARLOW, J.
           TITLE: OHMSETT SUPPORT

DW  930180010   ARMY CORPS OF ENGRS              32,000     WASHINGTON        DC  FP06-03-83    A 830620      06-01-83  12-31-85    JM
                COLD REGIONS RES & ENGR L     TEJY1A                                                           HERRMANN, J.
           TITLE: IMPACT OF FREEZING ON LEVEL CONTAMINANTS AT UNCONTROLLED HAZARDOUS WASTE SITES

DW  930180011   US ARMY CORPS OF ENG             30,000     HANOVER           NH  F 02-03-84    A 840210      06-01-83  12-31-85    JM
                RESEARCH & DEV LAB            TEJY1A                                                           HOUTHOOFD,J
           TITLE:  IMPACT OF FREEZING ON LEVEL OF CONTAMINANTS

DW  930235010   ENERGY DEPT.                     75,000     ALBUQUERQUE       NM  FP06-28-83    A 830819      09-01-83  08-30-85    JM
                ALBUUUERQUE OPERATIONS OF     CBRD1A                                                           BARKLEY, NAOMI
           TITLE: MAINTENANCE FREE VEGETATIVE SYSTEMS FOR LANDFILL COVERS

DW  930235011   ENERGY DEPT                     150,000     ALBUQUERQUE       NM  F 01-12-84    A 840201      09-01-83  08-30-85    JM
                ALBUUUERQUE OPERATIONS        CBRD1A                                                           BARKLEY,N
           TITLE: MAINTENANCE FREE VEGETATIVE SYSTEMS FOR LANDFILL COVERS:

DW  930236010   DEFENSE DEPT                    250,000     VICKSBURG         MS  FP06-16-83    A 830711      06-01-83  09-30-85    JM
                ARMY CORPS OF ENGRS.          CBRD1A                                                           AMMON, D.
           TITLE: LEACHATE COLLECTION & COVER DESIGN EFFICENCY & FACILITY RATE OF RELLASE ANALYSIS & VERIFICATION

DW  930244010   ARMY CORPS OF ENGRS              40,982     CHAMPAIGN         IL  FP07-07-83    A 830725      06-20-83  05-31-85    JM
                VICKSBURG WATERWAY EXPERI     CA2B1B                                                           VILLIERS, P.
           TITLE: DESTRUCTION & STABILIZATION OF SLUDGE SOLIDS BY MULTI-STAGE DIGESTION & THERMAL TREATMENT
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IAG NUMBER       AGENCY                             FUNDS AWARDED  CITY           STATE STATUS CO/DT  ACCEPT CO/DT   PROJECT PERIOD      GS
  OLD NUMBER     DEPARTMENT                          PRG ELMT      EPA LAB                                           EPA PROJ OFFICER
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DW  930244011    ARMY                                   44,544     CHAMPAIGN        IL  F 12-20-83                   07-01-83  06-30-85   JR
                 CONSTRUCTION ENG. RESEARC         CAZ81B      MERL/CIN                                               ENGLISH,J
              TITLE: DESTRUCTION AND STABILIZATION OF SLUDGE SOLIDS BY MULTI-STAGE DIGESTION

DW  930303010    AGRICULTURE DEPT                      150,000     UNIVERSITY PARK  PA  FP08-02-83    A 830902       08-01-83  12-31-85   PM
                 NE WATERSHED RES. CENTER          CBRD1A                                                             GRUHE, W.
              TITLE: RELATIONSHIP OF LABORATORY & FIELD DETERMINED HYDRAULIC CONDUCTIVITY IN COMPACTED CLAY SOILS

DW  930395010    TRANSPORTATION DEPT OF                116,000     WASH             DC  FP09-27-83    A 830902       08-01-83  12-31-84   JR
                 U.S. COAST GUARD                  H                                                                  GRIFFITHS, R
              TITLE: USE OF OHMSETT BY COAST GUARD

DW  930400010    CORPS OF ENGINEERS                     81,036     VICKSBURG        MS  F 11-24-80                   05-01-82  09-30-84   JR
  AD96F2A145     VICKSBURG WATERWAY EXPERI         TEJY1A                                                             R LANDRETH
              TITLE: TECHNICAL HANDBOOK FOR STBLZTN FOR REMDL ACTN UNCNTRLD SITES

DW  930575010    AGRICULTURE DEPT                       10,000     BELTSVILLE       MD  FP12-20-83    A 840120       12-01-83  06-30-84   MJ
                 BELTSVILLE AGRICULTURE RE         CAZ610                                                             STERN,G
              TITLE: ASSESS THE EFFECT OF THE COMPOSITION OF SEWAGE SLUDGE ON POTENTIAL USE IN AGRIC.

DW  930587011    AGRICULTURE DEPT                        4,000     BELTSVILLE       MD  F 01-12-84    A 840201       02-01-84  12-31-84   PM
  AD12F4029      SCIENCE & ED ADMIN                CAZ81B                                                             STERN,G
              TITLE: REGROWTH OF SALMONELLE IN COMPOSTED SEWAGE SLUDGE

DW  930680010    ARMY, DEPT OF                         175,000     VICKSBURG        MS  FP03-15-84                   02-01-84  06-30-84   JF
                 WATERWAYS EXPERIMENT STAT         CBRD1A                                                             HARTLEY,R
              TITLE: LABORATORY AND FIELD ASSESSMENT OF SETTLEMENT AND SUBSIDENCE IN HAZARDOUS WASTE LANDFILLS

                                                     1,649,562
                                                            19

RW  930062010    HEALTH AND HUMAN SERVICES              16,000     WASHINGTON       DC  FP04-20-83    A 830214                            JR
                 CENTER FOR DISEASE CONTRO         X6EM10                                                            LIGHT, L.
              TITLE: JOINT SUPPORT OF COOPERATIVE AGREEMENT WITH UNIVERSITY OF TEXAS HEALTH SCIENCES CENTER

RW  930234010    TRANSPORTATION DEPT                   246,000     WASHINGTON       DC  FP07-25-83                   07-01-83  06-30-86   JR
                 COAST GUARD                       X6EM10                                                             TAFURI, A.
              TITLE: DEVELOPMENT OF RESPONSE TECHNIQUES FOR DISCHARGES OF HAZARDOUS CHEMICALS THAT SINK

                                                       262,000
                                                             2

XW  930485010    ARMY DEPT.                            525,000     WASHINGTON       DC  F 04-12-82                   03-12-74  09-30-84   PB
  D4-0443        MATERIAL DEVELOPMENT & RE         A                                                                  M ROULIER
              TITLE: MIGRATION OF HAZARDOUS SUBSTANCES THROUGH SOIL
                                                       525,000
                                                             1

                                                     2,436,562
                                                            22
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                                     REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                          FUNDS AWARDED  CITY             STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD      GS
 OLD NUMBER     DEPARTMENT                        PRG ELMT     EPA LAB                                             EPA PROJ OFFICER
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DW  930162011   ARMY, DEPT OF                     55,000     VICKSBURG          MS  F 03-08-84                     07-01-83  05-31-86   PB
                WATERWAYS EXPER. STATION     TEJY1A          MERL/CINN                                              SANNING,D
           TITLE: ASSESSMENT OF GEOTECHNICAL ASPECTS AT UNCONTROLLED HAZARDOUS WASTE SITES

                                                  55,000
                                                       1

                                                  55,000
                                                       1
DW  930008010   INTERIOR DEPT.                    62,000     WASHINGTON         DC  FP02-04-83                     02-07-83  02-07-84   PB
                US FISH & WILDLIFE SERVIC    CCULIA          OEPER/HQ                                               QUINN, HERBERT
           TITLE: NATIONAL COASTAL ECOSYSTEMS TEAM, FWS, SLIDELL, LA.-DETAIL WILLIAM T. MASON, BIOLOGIST, GS-408-13/6

DW  930008011   INTERIOR DEPT                     55,000     WASHINGTON         DC  F 02-03-84                     02-07-83  02-07-85   PB
                FISH & WILDLIFE SERVICE      CAR                                                                    QUINN,H
           TITLE: DETAIL-WILLIAM T MASON  BIOLOGIST, GS408-13/6

DW  930065010   INTERIOR DEPT                                KEARNEYSVILLE      WV  FP03-01-83    A 830502         04-01-83  07-01-84   JR
                FISH & WILDLIFE SERVICE      CAHB1A                                                                 QUINN, H.
           TITLE: SECOND INTERNATIONAL CONFERENCE ON FIXED FILM BIOLOGICAL PROCESSES

DW  930147011   ENERGY DEPT.                      92,000     WASHINGTON         DC  F 05-25-83    A 830609         07-01-83  06-30-84   PB
 83DX0533       PACIFIC NW LAB               CHPC1A                                                                 CORDLE, S.
           TITLE: TECHNICAL SUPPORT FOR ORD PROGRAMS

DW  930169010   INTERIOR DEPT                      5,000     WASHINGTON         DC  FP06-13-83    A 830711         09-01-82  04-30-83   JF
                MINERALS MANAGEMENT SERVI    HFD83B                                                                 LIPKA, D.
           TITLE: REVIEW & ASSESSMENT OF FATE & EFFECTS OF DRILLING FLUIDS & CUTTINGS IN MARINE ENVRN.

DW  930182010   ENERGY DEPT                      120,000     WASHINGTON         DC  FP06-13-83    A 830718         10-01-83  09-30-83   JH
 83DX0533       BATTELLE/PACIFIC NORTHWES    CCVN1A                                                                 KEITH, W.
           TITLE: TECHNICAL ASSISTANCE TO ACID RAIN PLANNING STAFF

DW  930362011   DEPT OF COMMERCE                 280,000     WASHINGTON         DC  F 09-09-83                     10-01-82  09-30-83   PB
 83DX0514       NAT'L OCEANIC & ATMOS. AD    CDTA1D          ESRL/RTP                                               SCHIERMEIER,F
           TITLE: (UMBRELLA AGREEMT) FUEL SCALE PLUME STUDY, PHASE I

                                                 614,000
                                                       7

RW  930339010   COMMERCE DEPT                     50,000     ROCKVILLE          MD  FP08-26-83                     09-01-83  09-01-84   PB
                NATIONAL OCEANIC & ATMOSP    XBEM10                                                                 LIPKA, DOUGLAS
           TITLE: ACTION PLAN FOR EPA/NOAA OCEAN DUMPING RESEARCH

                                                  50,000
                                                       1
XW  930362010   COMMERCE DEPT.                    25,000     WASHINGTON         DC  F 02-01-83    A 830928         03-19-75  09-30-84
 80DX0514       NATIONAL OCEANIC&ATMOSPHE    A                                                                      D RICHARDS
           TITLE: INFORMATION ON ENERGY DEVELOPMENTS  UMBRELLA AGREEMENT
                                                  25,000
                                                       1

                                                 689,000
                                                       9
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IAG NUMBER       AGENCY                          FUNDS AWARDED  CITY                 STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       GS
  OLD NUMBER     DEPARTMENT                        PRG ELMT     EPA LAB                                                 EPA PROJ OFFICER
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DW  930082010    ENERGY DEPT                          70,000    UPTON                NY  FP03-11-83     A 830524      02-01-83  01-31-86    PM
                 BROOKHAVEN NATIONAL LAB.      CCVN1A           OER/HQ                                                 BENNETT, DAVID
             TITLE: COORDINATION AND STAFF SUPPORT FOR INTEGRATED ASSESSMENT OF ACID DEPOSITION

DW  930083010    ENERGY DEPT.                         71,000    RICHLAND             WA  FP04-15-83     A 830509      03-01-83  02-28-86    JF
                 PACIFIC NW LAB.               CCVN1A                                                                  BENNETT, D.
             TITLE: COORDINATION AND STAFF SUPPORT FOR INTEGRATED ASSESSMENT OF ACID DEPOSITION

DW  930174010    COUNCIL ON ENVIRON. QUALI            75,000    WASHINGTON           DC  FP05-25-83     A 830623      05-20-83  12-31-84    JH
                 EXEC OFFICE OF PRES.          CCMM1A                                                                  REUSS,J
             TITLE: CONFERENCE ON ENVIRONMENTAL SCIENTIFIC RESEARCH AGENDA FOR THE REST OF THE CENTURY

DW  930174011    COUNCIL ON ENVIRON QUALTI            75,000    WASHINGTON           DC  F 03-09-84     A 830810      05-20-83  12-31-84    JH
                 COUNCIL ON ENVIRONMENTAL      CCMM1A                                                                  REUSS, JOHN
             TITLE: CONFERENCE ON ENVRN SCIENTIFIC RES, AGENDA FOR REST OF CENTURY

DW  930192010    ENERGY DEPT                                    OAK RIDGE            TN  FP06-13-83     A 830719      05-15-83  11-15-85    JF
                 OAK RIDGE NATIONAL LAB.       CCVN1A                                                                  ROSENTHAL, R.
             TITLE: DEVELOPMENT OF ADVANCED INTEGRATED ASSESSMENT METHODOLOGIES FOR ACID DEPOSITION

DW  930194010    ENERGY DEPT.                         79,000    WASHINGTON           DC  F 11-21-80                   07-01-82  07-01-85    JH
  AD89F2A228     OAK RIDGE OPERATIONS OFFI     A                                                                       D BENNETT
             TITLE: ACID DEPOSITION RESEARCH PROJECT INVENTORY DEVELOPMENT

DW  930194011    ENERGY DEPT                          66,500    WASHINGTON           DC  F 06-13-83     A 830719      07-01-83  07-01-85    JH
  AD89F2A228     OAK RIDGE NATIONAL LAB        CCVN1A                                                                  COOK, D.
             TITLE: DEVELOPMENT & MANAGEMENT OF ACID DEPOSITION RES PROJ INVENTORY

DW  930195010    NATIONAL SCIENCE FDN.                75,000    WASHINGTON           DC  FP06-13-83     A 830720      05-16-83  05-15-85    PM
                 POLICY RES & ANALYSIS DIV     CCMM1A                                                                  REUSS, J.
             TITLE: APPLICATIONS OF DECISION ANALYSIS TECHNIQUES TO ENVRN. PROTECTION AGENCY ACTIVITIES

DW  930220010    EXECUTIVE OFFICE OF THE P            70,500    WASHINGTON           DC  F 09-08-82                   01-15-82  01-14-84    JH
  AD11F2A058     COUNCIL ON ENVIRONMENTAL      A                                                                       D BENNETT
             TITLE: SUPPORT COCHAIRMEN [illegible] INTERAGENCY TASK FORCE ON ACID PRECIP

DW  930220011    COUNCIL ON ENVRN QUALITY             52,200    WASHINGTON           DC  F 06-16-83     A 830711      06-01-83  11-30-83    JH
  AD11F2A058                                   CCVN1A                                                                  BENNETT, DAVID
             TITLE: SUPPORT OF COCHAIRMAN OF FEDERAL INTERAGENCY TASK FORCE ON ACID PRECIPITATION
DW  930238010    ENERGY DEPT.                         37,000    RICHLAND             WA  FP06-30-83     A 830718      06-01-83  12-31-84    JH
                 BATTELLE, PACIFIC NW LAB      CCVN1A                                                                  BENNETT, D.
             TITLE: COORDINATION & STAFF SUPPORT FOR INTEGRATED ASSESSMENT OF ACID DEPOSITION, ECONOMIC ASSESSMENT

DW  930311010    INTERIOR DEPT.                      100,000    WASHINGTON           DC  F 04-22-82                   10-01-82  09-30-83    JH
  AD14F2A322     U.S GEOLOGICAL SURVEY         A                                                                       J REUSS
             TITLE: INPUT TO DCSN SYSTEMS FOR ACID DPSTN GRT LKS & AGROECOSYSTEMS


DW  930311011    INTERIOR DEPT                        20,000    WASHINGTON           DC  F 07-21-83     A 830909      10-01-82  09-30-83    JH
  AD14F2A322     GEOLOGICAL SURVEY             BFD838           OER/HQ                                                 REUSS, J.
             TITLE: EVALUATE DECISION SYSTEMS FOR ACID DEPOSITION, GREAT LAKES, AND AGRICECOSYSTEMS

                                                     791,200
                                                          13
                                                     791,200
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                                              GRANTS INFORMATION & CONTROL SYSTEM

                                      REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                               FUNDS AWARDED  CITY              STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD        GS
  OLD NUMBER    DEPARTMENT                             PRG ELMT     EPA LAB                                               EPA PROJ OFFICER
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DW  930018010     ENERGY DEPT.                           30,000     OAKRIDGE            TN  FP03-30-83    A 830330     03-15-83  03-14-84    PW
                  OAK RIDGE NATIONAL LAB.          C9NA18       OHEA/HQ                                                 FOWLE, JOHN
              TITLE: MEASUREMENT OF 6-THIOGUANINE RESISTANT CELLS IN ETHYLENE OXIDE EXPOSED MICE

DW  930022012     ENERGY DEPT                            13,210     UPTON               NY  F 12-13-83    A 840112     05-01-83  09-30-84    PH
                  BROOKHAVEN AREA                  TEDY1A                                                               DELLARCO,VV
              TITLE: ASSESSING RISK FROM EXPOSURE TO ANEUPLOIDY-INDUCING CHEMICALS
DW  930064010     ENERGY DEPT.                          278,300     OAK RIDGE           TN  FP03-17-83    A 830425     03-01-83  02-28-85    JH
                  OAK RIDGE NATIONAL LAB.          CCPL1A                                                               ROSENTHAL, S.
              TITLE: GENETIC RISK OF CHEMICALS MUTAGENS AT ENVIRONMENTAL LEVELS

DW  930064011     ENERGY, DEPT OF                        43,000     OAK RIDGE           TN  F 03-27-84                 03-01-83  03-31-86    JH
                  OAK RIDGE LAB                    CCPL1A                                                               ROSENTHAL,S
              TITLE: GENETIC RISK OF CHEMICAL MUTAGENS AT ENVIRONMENTAL LEVELS

DW  930106010     ENERGY DEPT.                            5,000     OAK RIDGE           TN  FP05-25-83    A 830609     05-01-83  04-30-84    PW
                  OAK RIDGE NATIONAL LAB.          C9UA1C                                                               ANDERSON, E.
              TITLE: CONFERENCE ON RISK ANALYSIS IN THE PRIVATE SECTOR

DW  930292010     ENERGY DEPT                           350,000     WASHINGTON          DC  FP08-01-83    A 830818     10-01-82  09-30-85    JH
                  OFFICE OF ENVIRONMENT            CCYN1A                                                               MOGHISSI, ALAN
              TITLE: ENVIRONMENTAL RISK ANALYSIS
DW  930293010     ENERGY DEPT                           650,000     WASHINGTON          DC  FP07-22-83    A 830923     10-01-82  09-30-83    JH
                  OFFICE OF ENERGY RES.            CCYN1A                                                               MOGHISSI, A.
              TITLE: HEALTH RISK ANALYSIS AND ASSESSMENT OF EXPOSURE

DW  930309010     ENERGY DEPT.                          410,500     WASHINGTON          DC  FP08-09-83    A 830817     10-01-82  09-30-84    PM
  83DX0533        OFFICE OF ENVIRONMENT            CCYN1A                                                               MOGHISSI, ALAN
              TITLE: (UMBRELLA AGREEMENT) FOOD-CHAIN TRANSPORT OF SYNFUELS AND PEER REVIEW
DW  930540010     ENERGY DEPT                            30,000     UPTON               NY  FP12-09-83    A 840131     11-02-83  11-02-84    PW
                  BROOKHAVEN AREA                  CBTD1A                                                               V-DILLARCO
              TITLE: ANEUPLOIDY TEST DEVEL.: KINETOCHORE STAINING IN MAMMALIAN SYSTEMS

DW *930541010     LABOR DEPT                             21,271     WASHINGTON          DC  FP11-25-83                 12-01-83  04-01-84    PW
                  OCCUPATIONAL SAFETY AND H        CBTD1A                                                               RIS,CHARLES
              TITLE: LASER REMOTE MONITORING OF AIRBOURNE POLLUTANTS FROM LIGHT AIRCRAFT

                                                      1,831,280

                                                      1,831,281
                                                             10
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                                    REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER

IAG NUMBER      AGENCY                         FUNDS AWARDED  CITY            STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD      GS
  OLD NUMBER    DEPARTMENT                       PRG ELMT     EPA LAB                                            EPA PROJ OFFICER
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DW  930124010   HEALTH & HUMAN SERVICES D   1,823,300    WASHINGTON        DC  F 02-01-83                  10-01-82  09-30-83   JH
  AD75F24620    OFFICE OF THE SECRETARY     A            OHR/HQ                                             R CORTESI
           TITLE: NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH
DW  930124011   HEALTH & HUMAN SERVICES D     910,000    ROCKVILLE         MD  F 05-04-83   A 830415       10-01-82  09-30-83   JH
  AD75F24620                                D                                                               CORTESI, R.
           TITLE: NATIONAL CENTER FOR TOXICOLOGICAL RESEARCH PROGRAMS IN RISK ESTIMATION

                                            2,733,300
                                                    2

RW  930091010   ARMY DEPT.                     15,000    ABERDEEN          MD  F 03-17-82                  11-29-81  01-29-82   JF
  AR21F2A035    OFFICE CHIEF OF ENGINEERS   X6EH10                                                          HARVELL,R.
           TITLE: EXTENSION OF DETAIL NTE 120 DAYS - DR WAYNE GALBRAITH

RW  930091011   ARMY                                     ABERDEEN          MD  F 04-25-83                  10-01-82  09-30-83   JF
  AR21F3A035    ARMY ARMAMENT RESEARCH &    X6EH10                                                          HARVELL, R.
           TITLE: CASH AWARD RELATED TO GALBRAITH DETAIL FROM 11/29/81 TO 1/2/83

                                               15,000
                                                    2

                                            2,748,300
                                                    4

DW  930083012 . ENERGY DEPT                   135,000    RICHLAND          WA  F 11-08-83   A 831130       09-01-83  02-28-86   JF
                PACIFIC N.WEST LAB:         CCVN1A       OPSA/HQ                                            BENNETT
           TITLE: COORDINATION AND STAFF SUPPORT FOR INTEGRATED ASSMT OF ACID DEPOSITION

DW  930192012   ENERGY DEPT                   699,000    OAK RIDGE         TN  F 01-31-84   A 840217       05-15-83  12-31-85   JF
                OAK RIDGE NAT'L LAB         CCVN1A                                                          SCHWENGELS,P
           TITLE: DEVELOPMENT OF ADVANCED INTEGRATED ASSESSMENT METHODOLOGIES FOR ACID DEPOSITION

DW  930238011   ENERGY DEPT                   115,000    RICHLAND          WA  F 11-07-83   A 831130       06-01-83  09-30-85   JH
                                            CCVN1A                                                          BENNETT,D
           TITLE: COORDINATION AND STAFF FOR INTEGRATED ASSESSMT OF ACID DEPOSITION, ECONOMIC ASSMT.

                                              949,000
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                                                                                                                  PAGE    40
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                                    REPORT OF ALL IAGS BEGINNING WITH 93 IN THE IAG NUMBER
                                              FUNDS AWARDED  CITY            STATE STATUS CD/DT  ACCEPT CD/DT   PROJECT PERIOD       OS
IAG NUMBER      AGENCY                                                                                          EPA PROJ OFFICER
  OLD NUMBER    DEPARTMENT                      PRG ELMT     EPA LAB
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                                                  17,000     UPTON           NY  FP02-16-83   A 830524      02-01-83  09-01-84    JR
DW  930022010   ENERGY DEPT
                BROOKHAVEN NATIONAL LAB.      IEDY1A         ORD/HQ
           TITLE: ASSESSING RISK FROM EXPOSURE TO ANEUPLOIDY-INDUCING CHEMICALS
                                                 148,000     WASHINGTON      DC  F 11-08-80                 04-24-81  06-20-82    JP
DW  930287010   ENERGY DEPT.                                                                                 H WISER
  AD89F15570    LAWRENCE LIVERMORE LAB         A
           TITLE: IMPACT OF HALOCARBONS AND CHMCLS STRATOSPHERIC OZONE                                                            JP
                                                  39,298     LIVERMORE       CA  F 07-22-83                 WISER, H.
DW  930287011   ENERGY DEPT
  AD89F25570    LAWRENCE LIVERMORE NATION     CCML1A
           TITLE: IMPACT OF HALOCARBONS & OTHER CHEMICALS ON STRATOSPHERIC OZONE
                                                                                                            04-01-82  03-31-83    JP
                                                 120,000     WASHINGTON      DC  F 02-01-83                  H WISER
DW  930287020   ENERGY DEPT.
  AD89F25570    OFFICE OF THE SECRETARY         A
           TITLE: IMPACT OF HALOCARBONS & OTHER CHEMICLS ON STRTSPHRC OZONE
                                                                                                            11-01-83  10-31-84    JP
                                                   5,000     ROCKVILLE       MD  FP11-01-83   A 831110       WISER,HERBERT
DW  930494010   COMMERCE DEPT
  AD13F216160   NAT'L CLIMATE PROGRAM OFF     CCML1A
           TITLE: SUPPORT OF THE NATIONAL ACADEMY OF SCIENCES BOARD ON ATMOSPHERIC SCIENCES & CLIMATE
                                                 145,000     RICHLAND        WA  FP12-05-83   A 831222      10-01-83  09-30-86    PB
DW  930497010   ENERGY DEPT                                                                                  BENNETT,D
                PACIFIC NORTHWEST LAB          CCVN1A
           TITLE: DEVELOP. AND APPLIC. OF ECONOMIC METHODOL. FOR ANALYSIS OF ACID DEPOSITION IMPACTS

                                                 474,298
                                                       6

                                                 474,298
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                                              40,289,658
                                                     301
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10. R&D Goals in Support of Regulations

A. Question: Please explain to the Committee as specifically as possible -- use specific selected cases -- how the Office of Research and Development supports regulatory activities of the program offices. For example, under what circumstances and how does the ORD support the Office of Pesticides' Hazard Evaluation Division? Or, what role does ORD have in setting National Ambient Air Quality Standards and New Source Performance Standards under the Clean Air Act?

Answer: The Office of Research and Development supports the regulatory activities of the program offices in many ways. For example, EPA's pesticides research and development program provides continuous support to the Office of Pesticides Programs (OPP) Hazardous Evaluation Division (HED). Health and environmental processes and effects research provides OPP with the means to reduce the uncertainty under which pesticides regulatory decisions are made. Particular emphasis is placed on development and validation of protocols to predict and evaluate human health and environmental fate and effects resulting from exposure to pesticides.

With respect to the development of National Ambient Air Quality Standards (NAAQS) ORD develops criteria documents which serve as the primary documentation of scientific data for reviewing and potentially revising existing standards. These documents are based upon the health and welfare effects data developed by ORD and other research institutions. In addition, ORD provides the air quality models, emissions data, and monitoring tools needed to develop and enforce NAAQS. With respect to the development of New Source Performance Standards (NSPS), ORD develops data on the performance, cost and reliability of existing, new and emerging emissions reduction technologies to ensure that the standards can be met in the most cost-effective manner.

Finally, in the hazardous waste program, ORD's incineration research program is determining how permits should be written in order to ensure 99.99 percent destruction of hazardous chemicals. Because different types of incinerators have different operating characteristics (operaing temperatures, mixing rates, etc.) their effectiveness in destroying different waste streams containing different chemicals will vary. ORD's program in this area is determining what temperature and specific conditions are needed in order to destroy specific hazardous chemicals. Once determined, these conditions will be used by permit writers to articulate specific parameters for a particular waste in a particular type of incinerator.

B. Question: Are the FY 1985 levels for scientific assessment - $11.9 million - adequate in the face of revisions of clean air standards, water quality criteria, drinking water standards, and hazardous waste,

Answer: Yes, we believe they are. Within the Office of Research and Development, the Office of Health and Environmental Assessment (OHEA) is responsible for an Agency-wide program to provide the scientific foundation for evaluating the effects of environmental pollutants in varying exposure situations on human health and ecological systems.

The Office focuses on the following major activities:

1) Preparing a wide range of comprehensive documents required by environmental legislation to evaluate scientific data on exposure and related health and ecological effects;

2) Developing guidelines and methodology to ensure that the Agency carries out health effects and exposure evaluations in a uniform and scientifically credible fashion;

3) Recommending, in consultation with other scientists, a research program to improve the scientific basis for health, ecological and exposure assessment; and

4) Providing technical assistance to the program offices.

It is important to remember that the risk assessment process can only be conducted after considerable research is completed and basic information is available. Fate and transport information for the pollutants of concern must be developed, as must health and welfare effects data, and monitoring and analytical procedures. Research producing this information is conducted by other offices within ORD and by the scientific community at large. Therefore, in conducting risk assessments, OHEA is the last step in the process, making use of information developed by many other organizations over a period of several years. Consequently, the level of resources being dedicated to scientific assessments should not be equated with the level of risk assessment activities being carried out by the Agency.

In FY 1986, the resources for OHEA were increased by $957K to $11,901K. Specifically, these resources will be utilized to accelerate the development of comprehensive health assessment documents for potentially hazardous air pollutants under the Clean Air Act; accelerate efforts to complete a revised set of assessment guidelines for exposure, carcinogenicity, mutagenicity and reproductive effects; and provide additional technical support for the Office of Emergency and Remedial Response and support for enforcement activities under Superfund.

11. AGENCY MORALE AND PRODUCTIVITY

You have been quoted, on taking the reins at EPA, as saying," I saw my first priority as trying to solve four critical and immediate problems. The agency was demoralized; its credibility questioned. Many talented people had left EPA and its financial resources were spread thin."

A. What progress have you made in dealing with these "critical problems"?

We have instituted a number of management improvements within the agency. These improvements have been accomplished without causing disruption in on-going operations or displacement of personnel. I'd like to highlight a few.

The administrative and resource management responsibilities of the Agency have been placed under a single Assistant Administrator. The Agency now has the budget, finance, personnel, management analysis, procurement, ADP and information systems, and administrative support operations organized under and managed by the Office of Administration and Resources Management.

We reestablished an Office of Regional Operations headed by an Associate Administrator. The office serves as the Headquarters focus for ensuring the involvement of the Regional Office views and needs in all aspects of the agency's work.

There have also been substantive changes in the area of enforcement and legal activity. A new Office of Enforcement and Compliance Monitoring has been established, headed by an Assistant Administrator. The General Counsel is now a separate office. This restructuring has tended to clarify their roles with respect to the distinct type of legal activities they perform.

There has been established an Office of External Affairs under the leadership of an Assistant Administrator. The focus of this office is to improve communications with the public, establish better awareness of the agency's programs, and increase our effectiveness and outreach with the Congress, State and local groups and other Federal agencies.

Finally, we developed a strategic planning system that will enable us to keep track of key programmatic commitments by the Agency's senior managers. The system will make the Agency accountable and keep it accountable to the public on a continuing basis.

Regarding Employee morale we have:

- Made clear to managers that our most valuable resource is our employees.
- Created a work environment which is open, consultative and unbureaucratic.
- Recognized and rewarded employees for dedicated and sustained service.

At every opportunity, employees are being made aware of their importance to the agency. For example, on the agency's thirteenth birthday, we not only had a general meeting with employees as such, but the Deputy Administrator and I visited the various organizational units, and chatted with each employee.

In conjunction with the above, agency management has also started having "brown-bag" lunches with employees to find out what their problems are and how they can be resolved. This type of informal "give and take session" reenforces a work environment which is open and unbureaucratic.

B. What trends have you observed in recruitment rate, termination rate and average time in EPA employment for professionals by discipline since FY 1981?

The attached matrix reflects the recruitment rate, termination rate and average time in EPA employment for twenty significant professional disciplines in EPA. The information was obtained from the Agency's payroll/personnel system and includes data from FY 1981 through the second quarter of FY 1984.

OCCUPATIONS	ON BOARD END FY-80	FY 1981				FY 1982				FY 1983				FY 1984			
		RECRTMT. RATE	TERMIN. RATE	AVG. YEARS AT EPA	ON BOARD YEAR END	RECRTMT. RATE	TERMIN. RATE	AVG. YEARS AT EPA	ON BOARD YEAR END	RECRTMT. RATE	TERMIN. RATE	AVG. YEARS RATE	ON BOARD YEAR END	RECRTMT. RATE	TERMIN. RATE	AVG. YEARS AT EPA	ON BOARD YEAR END
Economist	83	7.2% 6	6.0% 5	4.9	76	0.0% ---	18.4% 14	5.5	76	5.3% 4	6.6% 5	6.2	65	4.6% 3	7.7% 5	6.4	67
Biologist	581	2.6% 15	7.9% 46	7.9	543	.7% 4	12.3% 67	8.8	537	1.1% 6	2.0% 11	9.8	513	6.8% 35	2.7% 14	9.7	537
Micro-Biologist	83	4.8% 4	4.8% 4	8.8	81	0.0% ---	3.7% 3	9.8	75	1.3% 1	4.0% 3	10.7	72	0.0% ---	0.0% ---	11.2	72
Pharmacology	39	0.0% ---	0.0% ---	6.3	35	0.0% ---	2.9% 1	7.5	33	0.0% ---	3.0% 1	8.5	31	6.5% 2	0.0% ---	8.5	33
Ecology	32	0.0% ---	6.25% 2	7.3	25	0.0% ---	24.0% 6	9.2	26	3.8% 1	7.7% 2	9.8	28	7.1% 2	7.1% 2	10.2	29
Accouting	196	5.1% 10	6.6% 13	6.1	189	10.1% 19	6.9% 13	6.9	203	8.9% 18	7.4% 15	6.6	86	5.8% 5	1.2% 1	6.8	89
Auditing	---	---	---	---	---	---	---	---	---	--- 22	--- 30	5.3	116	22.4% 26	6.9% 8	4.8	139
Hlth Scientist	66	3.0% 2	12.1% 8	5.1	50	0.0% ---	26.0% 13	6.7	49	4.1% 2	6.1% 3	7.5	43	2.3% 1	2.3% 1	8.1	43
Cons Safety	54	1.9% 1	1.9% 1	9.8	50	0.0% ---	4.0% 2	9.2	51	0.0% ---	5.9% 3	10.2	39	0.0% ---	2.6% 1	10.8	38
Gen Engineer	180	7.2% 13	3.9% 7	8.1	118	1.7% 2	10.2% 12	9.6	105	0.0% ---	16.2% 17	10.6	58	0.0% ---	1.7% 1	11.3	55
Env Engineer	1349	2.7% 36	2.7% 37	6.9	1315	0.2% 3	9.3% 122	7.9	1304	5.0% 65	3.4% 44	8.5	1253	15.4% 193	2.6% 33	7.8	1425
Mech Engineer	112	.9% 1	7.1% 8	6.1	96	0.0% ---	16.7% 16	7.3	91	0.0% ---	6.6% 6	8.3	72	8.3% 6	8.3% 6	8.2	75
Chem Engineer	145	4.1% 6	4.8% 7	8.7	134	0.0% ---	7.5% 10	9.8	128	7.8% 10	4.7% 6	10.0	124	8.9% 11	3.2% 4	9.0	130
Attorney	513	4.6% 49	3.5% 18	3.3	485	1.2% 6	15.1% 73	4.3	471	4.0% 19	8.5% 40	5.2	397	16.1% 64	5.8% 23	4.8	447
Env Scientist	1087	6.3% 68	2.9% 32	7.3	1036	0.8% 8	12.2% 126	8.3	1000	4.1% 41	5.3% 53	.9	921	6.5% 60	2.9% 27	9.0	978
Hydrology	21	23.8% 5	4.8% 1	4.7	22	0.0% ---	13.6% 3	5.7	24	12.5% 3	0.0% ---	6.1	32	25.0% 8	3.1% 1	5.3	41
Chemist	694	3.7% 26	3.7% 26	8.0	648	1.1% 7	9.1% 59	9.0	637	2.4% 15	4.0% 25	9.8	579	5.2% 30	2.8% 16	9.8	594
Geology	27	18.5% 5	7.4% 2	4.3	29	0.0% ---	6.9% 2	4.5	25	24.0% 6	0.0% ---	4.6	33	24.2% 8	0.0% ---	4.1	41
Opers Res Asst	76	0.0% ---	6.6% 5	5.5	59	0.0% ---	27.1% 16	6.5	55	0.0% ---	5.5% 3	7.5	45	4.4% 2	4.4% 2	7.7	47
Statistician	54	1.9% 1	7.4% 4	4.1	44	2.3% 1	18.2% 8	5.3	42	11.9% 5	9.5% 4	5.7	39	10.3% 4	0.0% ---	5.7	43

NOTE: Recruitment Rate = Number of New Hires/On Board Beginning of FY
Termination Rate = Number of Separations/On Board Beginning of FY
Average Years at EPA = Sum of (FY Year - EOD Year for Each Employee)/On Board At End of Year

AGENCY MORALE AND PRODUCTIVITY

You have been quoted, on taking the reins at EPA, as saying, "I saw my first priority as trying to solve four critical and immediate problems. The Agency was demoralized; its credibility questioned. Many talented people had left EPA and its financial resources were spread thin."

C, Question: What qualitative changes have you observed in measures of professional productivity and quality such as:

I. Average numbers of papers published in peer reviewed journals, internal EPA publications, conference addresses, etc. by category.

Answer: **DOCUMENTS SUBMITTED BY TYPE**

Average Number Per Day

	FY 1982	FY 1983
Journal Articles	1.6	2.7
Project Reports	1.7	2.3
Other (Proceedings, Methods, User Manuals, etc.)	1.5	2.1

C. Question: What qualitative changes have you observed in measures of professional productivity and quality such as:

II. The fraction of externally peer reviewed papers which are accepted for publication (after modification, if necessary).

Answer: We do not keep the kind of records which would allow us to answer that question. That fraction would not be an accurate reflection of productivity, which is a very difficult thing to measure.

D 1, Question: What is the selection procedure for program managers in R&D?

Answer: Program manager positions are filled by selecting current federal employees within the Agency or other federal entities, or by recruitment of non-federal employees. The majority of ORD's managers are in the competitive service, which requires application of Office of Personnel Management merit selection procedures. Such positions are generally widely advertised within federal agencies and at appropriate non-federal activities. Applications are reviewed and individuals are rated based on education and experience. Such procedures usually produce a reasonable number of well qualified candidates from which to choose. Management positions may also be filled by reassigning current EPA or other federal employees into vacant positions for which they are qualified.

2, Question: To what extent have ideal selection procedures been compromised by budgetary restrictions and position freezes?

Answer: Budgetary and position restrictions do not affect selection procedures i.e., we continue to fill manager positions through reassignment or merit selection methods, although the pool from which a selection may be made may be limited to the current organizational staff.

3. Question: Comment on the degree of mismatch between the qualifications and experience of program managers, and the requirement of the programs.

Answer: Most managerial positions in ORD require a combination of both scientific/research experience and managerial ability. However, the degree of mismatch between experience and qualifications versus requirements of the program is not a major problem within ORD. Managers compensate for the lack of some special skills by utilizing the talents of the individuals who work for them. Our managers are highly qualified and there is not a significant degree of mismatch between their skills and the requirements of the jobs.

12. Research to Support Enforcing Environmental Regulations

Question: EPA Administrator Ruckelshaus recently labeled EPA's enforcement effort as "terrible." In the budget presentation, strong emphasis in the Superfund budget is given to the role of the research program in supporting enforcement efforts. In the other enforcement programs, how effectively are the individual research programs tied to enforcement efforts?

Answer: In our more mature programs, like air and water, our research serves as the scientific basis for establishing the enforcement programs. In support of the air regulatory program, the Office of Research and Development provides the Regions, States, and local governments with the scientific data necessary to develop and enforce air emission standards. Specifically, ORD provides governments and the regulated community with ambient air quality models, emissions data, monitoring methodologies, quality assurance support, health and welfare effects data, and evaluations of the performance, cost, and reliability of emission reduction technologies.

The water quality research program provides support to the NPDES program and for drinking water enforcement. In the NPDES area, we provide standardized monitoring methods, and quality assurance support. We also provide information to support the development of water quality criteria, and methods for developing and enforcing toxicity-based permits. In the drinking water area, we provide standardized monitoring methods and quality assurance support, particularly to the State laboratory certification program.

Generally, we are working to enhance our monitoring and quality assurance assistance in all EPA program areas. Further, since the enforcement efforts of the Agency have been incorporated within the appropriate regulatory program offices, we rely upon our newly formed consolidated research committees (which have full representation from the program offices) to identify new enforcement-related research needs. Those needs will be considered in the budget formulation process for the 1986 submission as we did in the 1985 submission.

13. Long Term Research

13. QUESTION: What is current EPA policy for the funding, the duration and the content of long-range research at EPA?

ANSWER: The Agency recognizes the need to support long-range research. This research takes two forms--research that because of its complexity takes several years to complete and research designed to address more basic scientific questions. For the past several years, the Office of Research and Development has devoted about a third of its extramural research and development resources to long-term research. About 60 percent of this consists of research in support of the Agency's regulatory programs which requires several years to complete. This work is conducted and managed by the appropriate Office of Research and Development laboratories. The remainder, about $14 million per year, is managed by the Office of Exploratory Research to support the competitive grants and university research centers programs. The grants program supports investigator-initiated research proposals that have passed a rigorous extramural peer review and that are considered of potential relevance to the Agency. The university research centers were established to support scientific and technical advances in particular thematic areas where cross-discipline research is critical to producing scientific advances.

A. QUESTION: How are long-term research program resource requirements defined? What mechanisms exist to ensure that long-term research projects will be effectively insulated from disruptive annual changes in resource allocations?

ANSWER: The long-term research component managed by the Office of Research and Development laboratories is planned through ORD's research committee system. Research needs are identified by ORD laboratories and the Agency's regulatory offices and the resources are allocated to ensure the accomplishment of the particular research objectives. Beginning in Fiscal Year 1984, the Office of Research and Development established a separate budget category for the Office of Exploratory Research's competitive grants and university research centers programs. This action was taken to improve the management of this component of the Office of Research and Development's long-term research activities and to promote stability and continuity to investigators being sponsored through the grants program. Grant proposals are submitted in response to a solicitation outlining the Agency's long-term research needs and evaluated by outside experts for scientific quality and Agency personnel for relevance. Every effort is made to provide adequate and stable funding for these research grants during the life of the projects.

B. QUESTION: The "Centers of Excellence" funding for long-term exploratory research has decreased from the "start up" 1979 level of $500,000 per annum to about $420,000 annually. What effect do you expect this decrease to have on institutional memory and personnel turnover? What effect on the quality of the research?

ANSWER: Considerable confusion surrounds the funding of the university research centers. Since 1979, the centers have received different levels of funding from a variety of Office of Research and Development sources, ranging from $420,000 to over $1,000,000. The core support provided by the Office of Exploratory Research has in general remained at about $420,000 throughout this period, under the assumption that this core funding would act as a magnet to attract additional research funds from other sources including industry and other ORD laboratories. This core funding level was formalized when a separate budget was established for the grants and centers program in Fiscal Year 1984. This action has resulted in some centers having to refocus their research programs to the $420,000 support level. Once adjustment to the core support level has occurred, we do not believe this action will adversely effect either "institutional memory" or personnel. While the total number of studies conducted by the centers will be reduced, we do not expect any negative effect in the quality of the centers' research programs.

C. QUESTION: The Grace Commission report states that "ORD's financial support of the Centers of Excellence Program is no longer needed since many well-established sources for environmental research exist throughout the country." Please comment.

ANSWER: ORD's financial support of the Centers of Excellence at universities is necessary. Without EPA support the exploratory research conducted by the Centers would not be done. The Grace Commission is correct that many well-established sources for environmental research exist; however, those institutions are not addressing the research needed by EPA.

The EPA-supported Centers are not new institutions, but rather they provide an integration of a variety of existing university disciplines with relevant research expertise on the topic of concern. The selected Centers survived competition from a large number of organizations that applied.

In 1978, the Congress asked the Agency to analyze its high-priority research needs and to examine the most effective mechanism for addressing these needs. This analysis concluded that a number of critical areas existed that could be most appropriately addressed by universities, where the knowledge of a variety of disciplines could be focused on a particular topic. The Centers have been in existence for less than five years and are considered a necessary component of the Office of Research and Development's research program.

D. Question: Please explain to the Committee, again as specifically as possible, how EPA determines that it is meeting the requirement that 15% or 20% of its R&D be devoted to long-term, anticipatory research. Do you formally and explicitly separate these funds for accounting purposes? If so, provide examples to the Committee; if not, explain how you make the determination.

Answer: ORD estimates the dollar amount and percentage of extramural funds allocated to anticipatory research based on the following criteria:

- Any research that takes 3-5 years or longer to complete, or
- Any research that is fundamental, basic or exploratory in nature.

Each disciplinary office (e.g., Environmental Processes and Effects) within ORD provides this estimate and these estimates are aggregated by medium for a complete estimate. The total estimate includes the funding for the Exploratory Research Grants and Centers Program, which is the portion of the long-term, anticipatory research program that is explicitly separated for accounting purposes.

14. OMB as Super Regulator"

A, Question: Explain how you present proposed R&D budget requests to OMB. Has OMB ever involved itself in whether you should undertake--or cancel, or not undertake--specific R&D projects?

Give examples; for instance, was the cancellation of the Pesticides Monitoring Journal an EPA or OMB decision? Or does OMB only establish a ceiling, and permit you to determine what R&D should be done?

Answer: EPA's budget request to OMB provides extensive justification materials for its program activities. For instance, the budget request to OMB has the following components:

- A description of the long-range goals and major objectives for each program activity;
- Progress toward meeting major objectives are described including accomplishments of the past fiscal year, plans for the operating year, and expected accomplishments in the budget year;
- For each program, an explanation of the resource change between the budget request and the operating year resource level; and,
- A detailed projection of outputs and workload as well as a comparison to previous years.

In aggregate the budget request provides OMB with substantial detailed justification material for all of EPA's programs. It is OMB's responsibility to thoroughly scrutinize EPA's budget and identify areas which require resource emphasis or de-emphasis.

This OMB review is generally at a detailed level; recommending specific resource levels for individual program areas. However, while OMB's recommendations are detailed, their final resource determinations essentially establish ceilings by appropriation. This in effect allows EPA some discretion on whether to accept OMB's detailed program recommendations or not. That is, within the total appropriation EPA could decide to initiate a program which OMB does not recommend by displacing some other work within the appropriation.

8. Question: A January 4, 1984 article in The Washington Post stated that under guidelines developed in response to the Paperwork Reduction Act of 1980, OMB may veto requirements for medical and scientific tests of drugs, pesticides or toxic workplace chemicals. The Health and Human Services Department (HHS) was concerned enough to ask the Justice Department for a legal ruling on that issue. Has OMB vetoed any such EPA requirements to date? Have you had discussions on this issue with OMB?

Answer: OMB has not vetoed EPA requirements for medical and scientific tests of drugs, pesticides or toxic workplace chemicals in response to the Paperwork Reduction Act of 1980.

However, OMB and EPA have discussed the applicability of the Paperwork Reduction Act of 1980 to EPA requirements. There is agreement that testing results under TSCA do fall under the general guidance of the Paperwork Reduction Act.

15. CONTROL TECHNOLOGY

EPA has taken the position in recent years that research on control technologies should be the responsibility of industry rather than the Federal Government, and that in particular the demonstration of new technologies, which can be very expensive, should be industry's responsibility.

Question A: Recalling the important role EPA funds played in the demonstration of scrubber technology for removing sulfur dioxide from stack gases, in the face of industry resistance, do you believe it is reasonable or realistic to expect industry to research and demonstrate new pollution control technologies?

Answer A: To a great extent, yes. We believe that existing performance standards provide a sufficient market for new technology to provide the profit incentive for industry to risk doing much R&D. For example, spray-dryer technology was introduced, developed and demonstrated by industry with no federal support.

Question B: Considering the importance of acid rain and the desirability of a new generation of control technologies for sulfur dioxide and NO_x, do you believe EPA should support a demonstration of such new clean-burning technologies as fluidized bed combustion, LIMB technology, electron beams and low-NO_x burners?

Answer B: In the cases of fluidized bed combustion and electron beam technology, we do not believe EPA should support demonstration because:

- o Fluidized bed combustion technology is nearly commercial and our prior support of this technology should be adequate to guide our standard setting and review efforts for SO_x-NO_x.
- o We have no developed electron beam experience nor expertise to properly overview and support an electron beam demonstration.

In the cases of LIMB technology and low-NO_x burners, we believe some support of demonstrations may be appropriate because:

- o In the absence of regulatory incentives there has been very little industrial development in these technologies. Less costly and more efficient controls are also insufficient incentives for industry to develop the market. As a result, we have established a research expertise and are building our experience in developing these technologies. We expect the private sector to follow in the development of these technologies when the market picture is more encouraging.

- o LIMB technology is still a high risk research technology. Its potential suitability for either acid rain retrofits or for New Source Performance Standards reviews needs to be better defined, so we are working on the evaluation and development of this technology closely with our program offices, industry and other government agencies.

Question C: If you suggest that support for such R&D does or should reside in DOE, specify whether DOE is doing so, and provide the committee with any documentary evidence of EPA's proposing, supporting, or coordinating research for each such technology.

Answer C: There are two existing interagency activities that involve DOE and EPA research coordination: one is a 1979 Interagency Agreement coordinating air pollution control technology research, and the other is the Interagency Task Force on Acid Precipitation that was established by law.

In 1978, OMB determined that the responsibility for energy related control technology development should be divided between DOE and EPA, with DOE assuming primary responsibility for any new commercial-scale hardware projects, while EPA would conduct development efforts only through the pilot-scale. This determination required DOE and EPA to develop a coordinated program to assure continued progress in development of these technologies. DOE/EPA cooperative efforts were formally initiated with an Interagency Agreement in 1979.

Since 1979 working sessions have been held with the DOE Office of Coal Utilization and the EPA Office of Environmental Engineering and Technology every six months. Due to a reorganization at DOE and a major shift in program actitivies at DOE, the meetings were temporarily suspended but were resumed in February 1983. Attached is a copy of some recent correspondence between our Industrial Environmental Research Laboratory in Research Triangle Park, NC and DOE on the Interagency Agreement.

The Interagency Task Force Acid Precipitation has 10 working-level Task Groups, one for each of the National Program's nine research categories and one for international activities. These technical groups include program managers and experts from all the participating Federal agencies and National Laboratories. They are responsible for detailed planning and work in their assigned areas.

The DOE, Office of Fossil Energy, is chairman of Task Group B "Man-made Sources" in which EPA plays a major supporting role; similarly the EPA Office of Environmental Engineering and Technology chairs Task Group H "Control Technologies" which coordinates activities of DOE, EPA, and Tennessee Valley Authority regarding control technology development.

These Task Groups meet numerous times throughout the year and provide the research material used in developing the Annual Report to the President and Congress on the National Acid Precipitation Assessment Program. The 1983 Annual Report is due to be available in June, 1984.

ATTACHMENT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
INDUSTRIAL ENVIRONMENTAL RESEARCH LABORATORY
RESEARCH TRIANGLE PARK
NORTH CAROLINA 27711

February 29, 1984

Ms. Barbara Bishop
Office of Environmental Analysis (EP-33)
U.S. Department of Energy
Washington, DC 20585

Dear Barbara:

Reference EPA/DOE Interagency Agreement number DE-AI01-80EV10473 entitled "Assessment of the Adequacy of Advanced Environmental Technology for Controlling NOx and SOx." Pursuant to your request, I have itemized the list of reports which were prepared under this agreement.

o Task I - Assessment of the Effectiveness of Combustion Modification of Boilers for NOx Control

Thirty-Day Field Tests of Industrial Boilers:
*Site 1 - Coal-Fired Spreader Stoker (EPA-600/7-80-085a, April 1980)
*Site 2 - Residual-Oil-Fired Boiler (EPA-600/7-80-085b, April 1980)
*Site 3 - Pulverized-Coal-Fired Boiler (EPA-600/7-80-085c, April 1980)
*Site 4 - Coal-Fired Spreader Stoker (EPA-600/7-80-085d, April 1980)
*Site 5 - Gas-Fired Low-NOx Burners (EPA-600/7-81-095a, May 1981)
*Site 5A - Oil-Fired Low-NOx Burner (not published)
*Site 6 - Gas-Fired Fire-Tube Boiler (EPA-600/7-81-095b, May 1981)

o Task II - Assessment of the Capability of Heavy Oil Burners to Achieve Low NOx Emissions

**"Development of a Low NOx Burner For Enhanced Oil Recovery" - Paper presented at and published in Proceedings of the 1982 Joint Symposium on Stationary Combustion NOx Control, November 1-4, 1982, Dallas, Texas. (EPRI-CS-3182, July 1983)

o Task III - Assessment of SOx FGD Systems

- Continuous Emission Monitoring for Industrial Boilers at General Motors Corporation's Assembly Division, St. Louis, MO
  **Volume I - System Configuration and Results of the Operational Test Period (EPA-600/0-82-090a, October 1982)
  Volume II - Data Tables (EPA-600/0-82-090b, October 1982)
  Volume III - Sampling and Analytical Procedures and Appendices (EPA-600/0-82-090c, October 1982)

- Continuous Emission Monitoring for Industrial Boilers at Mead Paperboard Plant in Stevenson, AL

  **Volume I - System Configuration and Results of the Operational Test Period (EPA-600/0-82-091a, October 1982)
  Volume II - Data Tables (EPA-600/0-82-091b, October 1982)
  Volume III - Sampling and Analytical Procedures and Appendices (EPA-600/0-82-091c, October 1982)

- The Adipic Acid Enhanced Flue Gas Desulfurization Process for Industrial Boilers

  *Volume I - Field Test Results (EPA-600/7-82-065a, November 1982)
  *Volume I - Project Summary (EPA-600/S7-82-065a, March 1983)
  **Volume II - Technical Assessment (EPA-600/7-82-065b, November 1982)
  **Volume II - Project Summary (EPA-600/S7-82-065b, March 1983)

If you need additional information to close-out this agreement, please contact me.

Sincerely,

J David Mobley

J. David Mobley
Emissions/Effluent Technology Branch
Utilities & Industrial Processes Division

Enclosures

Department of Energy
Washington, D.C. 20545

MAR 21 1983

Mr. E. L. Plyler
Director, UIPD (MD-61)
U. S. Environmental Protection Agency
Industrial Environmental Research
  Laboratory
Research Triangle Park, NC 27711

Dear Bill:

I just wanted to take this opportunity to thank you for initiating the recent coordinating meeting and for going the extra miles to meet with us in Germantown. Both Howard and Dick were very pleased that by holding the meeting out here, they were able to participate.

Regarding the Interagency Agreement, if you recall, I mentioned that in line with our decentralization policy, we would probably transfer it out to PETC. Following the meeting, Howard met with Dick and broached this subject. Dick indicated a preference for maintaining the agreement at DOE Headquarters though we may use PETC personnel as Technical Project Officers on any future tasks. Therefore, I'll be submitting the paperwork shortly to extend the agreement beyond the current 9/83 expiration date and have also requested that PETC review your proposed joint research initiatives in light of our FY 1983 budget to see if it appears appropriate to initiate any new tasks under the agreement this fiscal year.

I will be looking forward to our next meeting at RTP in the Fall.

Sincerely,

Mike

Michael Perlsweig
Office of Coal Utilization
  Systems

16. ACID RAIN

1. Question: In May at your swearing-in, President Reagan said, "I would like you ... to meet this issue (Acid Rain) head on." In October your acid rain plan was overruled, apparently by OMB.

A. What was your plan for dealing with acid rain? Why was it overruled?

Answer: I have been asked these two questions several times, both in hearings before the Senate Committee on Environment and Public Works and before the House Committee on Energy and Commerce. Each time my answer has been the same.

It is my responsibility as a part of the Administration not to limit the President's options to simply the approval or disapproval of a single plan or recommendation. Instead, it is my responsibility to provide the President an array of options, all of which fall within the band of possible responsible actions. As a part of this array I should provide clearly delineated pros and cons for each approach and provide my best effort at making a sound recommendation. I believe that in carrying out this process, I have the responsibility of protecting the President's decision-making ability so that he is free to choose whichever option he deems to be the correct one for the overall public good. This is what I have done in the case of acid rain and why I continue to refrain from publicly discussing the specifics of my recommendations to the President. The President has chosen a course of action which I believe is a responsible one, given our current state of knowledge in the acid rain area.

B. Question: When will you take your recommendations to the Cabinet Council on Natural Resources again?

Answer: I have highlighted in my testimony before the House and the Senate some of the most important areas of uncertainty which need to be addressed before a responsible decision on acid deposition can be made. These areas include providing a more systematic and quantitative description of the magnitude and scope of damage that has occurred, a broader understanding of the pace at which damage is occurring and a more detailed, scientific understanding of the mechanisms of acid rain's causes and effects. It will not be necessary to have a complete or definitive answer to each of these areas of uncertainty before new recommendations can be developed. As we continue to gain knowledge about these aspects of acid deposition, our ability to predict the results of various control efforts will increase and we will reach a point at which the Administration can reasonably make a decision regarding the need for additional controls. I cannot tell you exactly when that point will come, for I cannot predict what the answers from the research program will be or precisely when they will be forthcoming. What I can say is that I take it as an affirmative duty on my part as Administrator of EPA to assure that we make policy reassessment an active and ongoing process, and that I communicate the product of this effort to the key decision-makers in the Administration including the President as soon as appropriate.

2. Question: The Administration's policy on acid rain - no action without further study - presumes that major ecosystems are not near the breaking point, that we can delay action without risking significant degradation.

2.A. Are you certain you are not risking significant degradation with these delays?

Answer: The extent of our current knowledge does not suggest that major ecosystems are about to collapse due to the effects of acidic deposition. We do treat the question quite seriously, and have initiated programs that address the problems of rates of change in ecosystems.

In the area of aquatic effects, the National Lake and Stream Survey will accomplish two major objectives. First, it will give us a synoptic picture of the current condition of the Nation's aquatic resources. Second, it will identify sites that are representative of regions in the U.S. that will be monitored on a long-term basis, providing us with information on any trends in these aquatic ecosystems.

EPA also funds research that will enable us to distinguish between those aquatic systems that show a direct response to acidic deposition, and those that have a delayed response. We have also sponsored the preparation of maps that show the distribution of waters that may be sensitive to acidification from any cause, and we are keeping these maps up-to-date.

In the terrestrial area, neither growth reductions and diebacks in one species of tree have been conclusively linked to acid deposition, nor is there evidence that the rates of change of these phenomena have increased over the past decade. However, we have begun planning for an extensive survey of terrestrial ecosystems that has a counterpart role to the aquatic survey: first, the condition of the Nation's terrestrial ecosystems will be assessed, and second, representative sites will be selected for long-term monitoring.

Further details may be found in the answers to the specific questions on forests and lakes and streams.

2.8. Question: In Germany the percentage of severely damaged forests has increased from 7 percent to over 25 percent in five years. Some scientists believe that the resilience of the Black Forest has been exhausted, most probably from atmospheric pollution.

How can we be sure that the same phenomenon is not occurring in North America?

Answer: The condition of the forests in Germany and countries in eastern Europe is clearly a matter of great concern, especially so because of the apparent increase in the rate at which damage has occurred there. We do see, however, significant differences between the present situation in German forests and in our forests.

The current situation in the U.S. is that one species of tree, red spruce, shows extensive dieback at higher elevations at several sites in the East. Unlike the German forests, no dieback has been seen in hardwoods, nor in coniferous trees at low elevations. We have identified reductions in growth in several species of trees: red spruce and pitch pine at all elevations in their entire ranges and shortleaf pine in the northern part of its range show growth reductions that began in the early 1960's and have continued. There are indications that other species may have similar reductions in growth, but these data are still preliminary.

There are many reasons why trees show reductions in growth. We do not know definitively why this reduction has occurred in conifers in the U.S.A. Effects from acidic deposition or related factors are suspects, but they have neither been excluded as causes of damage, nor proven to be causes of damage. Several hypotheses of the mechanism of damage have been proposed, and these are being tested by research funded by EPA and other agencies in the Interagency Task Force.

At this time, we have no evidence in the U.S. that rates of dieback and growth reduction are increasing. Nor do we have any evidence of dieback in hardwoods. However, because of our concern over the situation in Germany and what it might tell us, we have initiated several programs.

First we have planned an exchange of scientists between Germany and the U.S. in May and June of 1984. Because there are important differences in the symptoms shown by trees in German forests and symptoms shown by trees in our forests, we have arranged an exchange of German and U.S. field researchers for two purposes. The first is to provide the scientists with common field experiences-an important step in comparing the situations in the two countries. The second purpose is to produce a set of testable hypotheses of the mechanisms of damage to forests. Because acidic deposition effects are only one of a large number of possible hypotheses, the clear identification of testable ideas is extremely important.

Secondly, EPA has begun the planning for an extensive Terrestrial Survey. This survey will provide an assessment of the current condition of our forest ecosystems and will also identify sites for long-term monitoring. These sites will consider forests in two ways: both as receivers of acidic deposition and as modifiers of the input to aquatic systems, i.e. as entire watersheds.

Third, the Interagency Task Force, of which EPA is a member, has sponsored and will continue to sponsor research on the possible mechanisms of damage to forests, so that we may know precisely what processes are at work.

Question 2C: What is the situation with respect to degradation of lakes and streams? Have lakes and streams become more acidic over the last 15 years? How would currently acidified lakes in the eastern U.S. and Canada respond to substantially lower levels of acid rain? What research is necessary to answer those questions?

Answer: Evaluation of changes in surface water chemistry over time related to acidic deposition is difficult because of a lack of reliable historical data. Further, different lakes and streams respond differently to given loadings and year-to-year variability may obscure changes due to acidic deposition. Two recent studies, however, suggest the presence of trends in sulfate and alkalinity which relate to trends in SO_2 emissions. A draft report by Brookhaven National Laboratory to EPA (Hendrey, G. R., C. G. Hoogendyk, and N. F. Gmur, 1983, "Analysis of trends in the chemistry of surface waters of the United States," draft report for NAPAP Projects E1-8 and E2-11, received December, 1983) states that the regional sulfate average for surface waters in the New York-New England region reached a maximum in 1970, corresponding with the 1967-1970 peak in SO_2 emissions for the region. Regional average sulfate concentrations in surface waters appear to have decreased since 1970, along with SO_2 emissions, while alkalinity may have increased. This supports a recent analysis by the U.S. Geological Survey (Smith, R. A., and R. B. Alexander, 1983, "Evidence for acid-precipitation-induced trends in stream chemistry at hydrologic benchmark stations," Geological Survey Circular 910) of water quality records dating to the mid-1960's from their national network of 47 headwater benchmark stations. Analysis of data there shows small decreases in stream sulfate concentraitons in the Northeast, small increases in the Southeast, and larger increases in the West. This agrees with reported patterns in the trends of SO_2 emissions. The overall conclusion was in support of the hypothesis that the observed patterns in water quality trends reflect regional changes in the rates of acidic deposition and that decreases in sulfate emissions in the Northeast have resulted in water quality improvement. We suggest caution on the tentative nature of these scientific conclusions.

If acidic deposition levels were substantially decreased, affected clearwater lakes whose acidity is limited by the rate of acidic deposition likely would rapidly become less acidic; those are lakes that are fed primarily by direct precipitation. Lakes which were acidified more slowly because of indirect effects on soils in their watersheds would be expected to respond more slowly. Of these lakes in the Northeast, where soils are thin and possess a very limited ability to retain sulfate inputs, would probably respond faster than those in the Southeast where soil sulfate retention is greater.

More research is needed to amplify current inadequate knowledge in the above areas. Increased use of paleolimnological techniques may supply missing information on past acidification trends through the analysis of lake sediment cores. The long-term monitoring of surface waters will also detect any future dramatic changes in alkalinity. In order to be able to predict the future response of surface waters to either changes in deposition or continuation of present rates, intensive work is required on sulfate retention characteristics and mechanisms in watersheds, release of base cations from soil to water, replenishment of base cations to soil exchange sites, and the importance of biological and biochemical transformations, particularly on the sulfur system. Monitoring of both the aquatic and terrestrial components of selected watersheds will provide needed information on changes in those systems and their relation to acidic deposition.

Question 2D: You have called for a major lake survey to assess the health of waters in sensitive regions. This survey will provide a useful "snapshot" of these resources, but it will not tell us anything about the rates at which we are losing lakes, or the likelihood of a sudden ecological collapse, such as what happened with the German forests. What plans do you have for long-term monitoring to determine rates of change?

Answer: Long-term chemical monitoring of lakes and streams is currently being carried out by EPA on 138 lakes and streams in the Rocky Mountains, Upper Midwest, New England, Adirondacks, Catskills, Appalachians, and the Piedmont region. This program will be expanded as Phase III of the National Surface Water Survey. Additional regionally representative lake and stream monitoring sites will be selected, based on results of Phase I of the Survey, and biological parameters, including fish, will be added to the existing protocols. Similarly, a survey of terrestrial resources, focusing on forested systems, is being planned to begin in FY 85. The two major areas of concern will be forests as target ecosystems for acidic deposition, and forest ecosystems as mediators of surface water quality.

3. Question: Control of sulfur dioxide emissions would not only reduce acid rain; it would also decrease particulate pollution and increase visibility, giving immediately beneficial economic and general health results. How much weight have these factors received in the current policy decision to delay action until more research has been completed?

Answer: In examining the question of acid deposition, I chose to address this question directly on its own merits and not confuse the central issue of controls for acid rain with related but separate issues such as visibility, particulate loading or primary health effects from SO_2 emissions. The subject and focus of concern has been the spectrum of possible actions needed to respond to acid rain, not what are the possible rationale for expanding SO_2 controls. At the same time, we at EPA have not been nor will we be oblivious to the inter-relationship between protecting visibility and the management of acid rain. We have formed within EPA a task force to look at the problems and issues surrounding the visibility question. This task force will be looking at all aspects of the causes and solutions to diminished visibility and not simply the role of sulfur emissions. Before final recommendations are developed for either visibility or acid deposition, we expect to integrate these analyses so that we can have some idea of the total cost and benefits associated with actions taken to address either of these problems.

Question 4: The Administration anticipates launching an acid rain mitigation effort in FY 85 through the U.S. Fish and Wildlife Service. Approximately $6 million is requested for a lake liming and restocking effort. Has EPA been involved in research on lake liming and the possible effects of a major lake liming program? Will any of the EPA-funded acid rain research budget be directed in support of the Fish and Wildlife Service lake liming mitigation effort? What do we know about the effectiveness of lake liming on acid affected lakes?

Answer: Our knowledge about the effectiveness of liming acidified lakes draws heavily on the experience in Sweden, Norway, and Canada. We know that liming can dramatically improve chemical conditions (e.g., pH and alkalinity increase) in acidic waters, but that the beneficial effects are transitory. The period between reapplications of lime can be as long as several years, but more frequent applications are required in lakes with rapid flushing rates. We know that fish often exhibit good growth rates in limed lakes, but our knowledge of possible metal interactions and effects on other organisms is not well developed. The mitigation plan being developed with the U.S. Fish and Wildlife Service will focus on providing the answers to the ecological effects of liming acidic lakes and streams.

EPA has worked with the U.S. Fish and Wildlife Service since FY 82 on mitigation (liming) strategies for lakes and streams. As part of this joint effort, the U.S. Fish and Wildlife Service has published several technical reports summarizing available research on liming and has sponsored workshops on research needs in liming lakes and streams. More recently, a modest field research effort has begun in the Adirondacks on the effects of liming and the best approaches for restocking the lakes with fish.

Much of the recent effort by EPA mitigation staff has been devoted towards working with the U.S. Fish and Wildlife Service in developing the major National Acid Precipitation Assessment Plan initiative to assess the ecological effects of liming. Of the $500K available in EPA's FY 84 budget for mitigation, $250K is allocated for developing and implementing the detailed experimental design with the U.S. Fish and Wildlife Service for the FY 85 mitigation program. The majority of the $250K supporting the U.S. Fish and Wildlife Service program will directly fund research identified in the plan currently being developed.

17. GROUND WATER

1. Question: One of the major environmental issues facing the U.S. is contamination of ground water by toxic chemicals. Aldicarb, EDB, and chloroform are just a few chemicals that have been detected in significant quantities at sites across the country. The cost of decontamination of the affected aquifers can be enormous.

A. What research does EPA have underway that could reduce the cost of cleanup of ground water?

Answer: There are two categories of methodologies that can be applied to cleanup of already contaminated ground water. The first is withdrawal and treatment of the contaminated water for specific uses, such as drinking, irrigation, or industrial process water. The technologies for this kind of treatment of contaminated water are well known, and current EPA research is directed toward decreasing the cost and improving the effectiveness of various drinking water treatment technologies, including those which are applicable for cleaning up contaminated ground water.

The second group of methodologies applies to the actual cleanup of the water in the aquifer itself. Although some techniques have been tried and have appeared to be successful, the cost and effectiveness of these methods is not very well documented. The EPA Ground Water Research Program has a significant and increasing portion of its research devoted to aquifer restoration. In 1984 we will evaluate the potential at laboratory scale of aquifer restoration techniques identified as promising in our literature searches and preliminary research conducted in 1982 and 1983. In 1985 we plan to evaluate some of these techniques in a small field study. It is important to note that, although the Ground Water Research Program has a portion of its resources denoted as aquifer restoration, the research directed toward better understanding and prediction of subsurface processes will also contribute to our selection and evaluation of aquifer restoration techniques.

B. Question: Will the technology to clean up ground water at a reasonable cost be available before major contamination problems develop?

Answer: As noted above, there already exist well-known methods for treating contaminated ground water for drinking. As for aquifer cleanup techniques, the technologies exist, but we have very little information on either the cost or the effectiveness of those technologies. Whether the cost of either category is reasonable depends on how scarce the water is in the location of the contamination and whether an alternate source exists.

2A: O. What is the extent of ground-water contamination by hazardous constituents at sanitary landfills as shown by current monitoring?

A. EPA has very limited information on current ground-water monitoring and the extent of ground-water contamination by hazardous constituents at sanitary landfills regulated under Subtitle D of RCRA. Sanitary landfills are basically regulated by States with little Federal oversight since 1981, when the grant program ended for State Subtitle D programs. Most sites do not monitor ground water. Of those that do, most monitor only indicator parameters (e.g., pH, specific conductance, chlorides), some periodically monitor heavy metals, but relatively few monitor for other hazardous constituents.

There are about 12,000 to 18,000 municipal waste and about 75,000 on-site industrial waste disposal facilities (sanitary landfills and open dumps) in the U.S. A survey was recently conducted by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and Waste Age magazine. Preliminary results from the survey show 1,714 out of 5,621 (or 30%) municipal waste landfills evaluated have ground-water monitoring. Results from the same survey show that 191 out of 2,485 (or 8%) municipal waste landfills evaluated failed to meet the ground-water standard (i.e., exceeded the Primary Drinking Water Standards). The Agency has some case studies of sanitary landfills with ground-water monitoring data. See the next response for additional information.

2B: Q. What types of contaminants are being found in the ground water around sanitary landfills and what dangers do they pose to human health?

A. EPA has only limited data in this area. The most current is in a 1982 study the Agency conducted to identify the causes and effects of contamination at landfills. A total of 396 landfills and open dumps were studied. Many of them are on the Superfund priorities list. Contaminants that were identified include: volatile halogenated organics, volatile non-halogenated organics, pesticides, PCBs, metals, acids, bases, cyanide, aldehydes, ketones, radioactivity, asbestos, and ammonia compounds. It is important to keep in mind, however, that many of these facilities have been in existence for many years and have received in the past wastes that for the last four years are required by Federal law and regulations to go to hazardous waste facilities.

Human health effects are normally correlated with the concentration of and duration of exposure to the specific contaminant. There has been better documentation for acute affects resulting from high concentrations over short periods of time than for chronic effects resulting from the exposure of low concentrations for a long period. Some health effects data are available from some of the Superfund sites, but the wastes in these sites are more representative of wastes currently going to hazardous waste facilities.

2C: Q. Are there alternate methods to detect the presence of hazardous materials in sanitary landfills besides ground-water monitoring?

A. Yes. First, if the landfill has a leachate collection and removal system or double liners with a leachate detection and removal system between them, the leachate can be analyzed to determine the presence of hazardous contaminants. Another method is the taking of core samples of the waste in the sanitary landfill, passing a leaching liquid through them (e.g., water), and analyzing the leachate for hazardous constituents.

Another method is to monitor the unsaturated zone; ground-water monitoring is conducted in the saturated zone. There are a number of methods for monitoring the unsaturated zone below landfills. Although most methods are still in the research stage, a few have been shown to work effectively in certain situations. These include electrical resistivity, lysimeters, and neutron moisture logging. There are, however, limitations to all the currently available methods. These limitations include: (1) major problems with the installation of an effective system at existing landfills; (2) difficulty in the repair of damaged or failed systems; (3) the need for an adequate unsaturated zone above ground water to prevent interference; and (4) lack of extensive field experience.

2D: Q. Should construction, location, and monitoring requirements be imposed on sanitary landfills to minimize impact from accumulation of hazardous waste?

A. We need more information to answer this question. We would have to determine, for example, what the problems are, whether such requirements are warranted, and, if so, under what conditions various standards are needed.

The appropriate construction, location, and monitoring requirements are a function of a number of factors including the type of wastes, the hydrogeologic setting, and facility design. These factors need to be better understood before recommending regulatory revisions.

2E, Question: What research is EPA undertaking on low cost field equipment to make qualitative measurement of the presence or absence of toxic constituents in landfills and groundwater?

Answer: Three methods appear most promising: 1) The X-Ray Fluorescence hardware developed by NASA is being adapted as a portable rapid screening field device for hazardous wastes. Characterization tests are underway to determine sensitivity for Sb, As, Ba, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, and Zn. Limits of detection will be determined for these elements in sludges, water and soils.

2) A portable method employing a plexiglass dome and ancillary equipment for directly measuring volatile organic compound emission rates from contaminated soils and/or groundwater is being developed. This method will yield qualitative analysis of the vapors to assist in plume identification. Benzene and TCE are the selected contaminants being tested. This technique has the lowest detection limit of all methods examined. The technique is not affected by meteorological conditions. It is simple and economical.

3) A third technique being investigated uses fiber optics for monitoring groundwater contaminants. The optrodes (sensors) are rugged and inexpensive. The technique involves fluorescence of the sample using a low power laser and analysis of the fluorescence signature with a spectrometer.

3.A. Question: A 1981 EPA survey found that of all the various land disposal technologies utilized, just over 50% of hazardous wastes were injected into deep wells.

What is the current state of scientific information regarding the health and environmental impact of deep well injection of hazardous wastes?

Answer: In order to answer this question, it must be separated into two parts: First, what is the state of scientific information on whether injected wastes will contaminate underground sources of drinking water or reach some other point of environmental impact? If so, at what concentrations? Second, What is the state of knowledge on the impact of those concentrations?

Although the behavior of only a few specific trace organic chemicals in ground water is now understood, the behavior of liquids in the subsurface is much better defined. That is, we can relatively confidently predict whether injected wastes will reach an underground source of drinking water, but not so confidently predict their concentrations if they should. The EPA Underground Injection Control Regulations were based on this confidence that we can indeed assure through proper well siting, construction, and operation that wastes will remain in the zone into which they are injected. This in turn gives us confidence that proper deep well injection under the law will have no adverse effects on underground sources of drinking water.

As for the potential impact of wastes on health and the environment should they actually reach a drinking water source, there is a large data base on the toxicity of many chemicals, both for environmental species and for humans, that has developed over many years. That is not to say that we know the toxicity of every chemical in a waste or the toxicity of the waste as a whole. There are methods, however, of assessing the potential impacts even if a toxicity data base does not exist.

3.B. Question: What EPA research programs are underway to study the health and environmental impact of deep well injection?

Answer: A major objective of the EPA Ground Water Research Program is to provide new and improved methods for predicting the concentrations at some point of use or impact of chemicals introduced into the subsurface from any source. These methods are and will be applicable to deep well injection of wastes. Another major objective is to provide and evaluate the effectiveness of technology to assure that the injected liquids enter and remain in the intended zone of injection. In 1977, the Ground Water Research Program, in cooperation with leading National authorities, published a report, "Introduction to the Technology of Subsurface Wastewater Injection," which continues to be the accepted guide for constructing and operating environmentally sound injection wells. Our Research Program continues to develop and test methods to assure that these wells remain environmentally safe. In fact, the American Petroleum Institute is carrying out a research program complementary to ours. A final major objective is to provide cost-effective monitoring tools to quickly and efficiently determine whether undesirable migration is occurring.

In addition, the EPA, as well as the National Institute of Environmental Health Sciences, the National Cancer Institute, the National Toxicology Program, the Center for Disease Control, and others, has a large and continuing research program to determine the health and environmental impacts of chemicals and wastes.

3.C. Question: Should it become necessary, does the technology exist to clean up water at the base of these deep wells? If not, does the EPA have a research program underway to develop this technology?

Answer: Wells injecting hazardous wastes are required by the EPA Underground Injection Control Regulations to inject into strata that are below the deepest underground source of drinking water and must have an adequate confining layer above the injection zone. Therefore the water in the formation at the base of these wells is not suitable for drinking, and there would be no reason for cleanup. The concern is the potential for migration of wastes into sources of drinking water, either through natural migration or due to faulty well construction and maintenance. As pointed out above, we have both methods and continuing research addressing this concern. In addition, as previously mentioned, we have both technology for and research on cleaning up contamination in ground water.

18. HAZARDOUS WASTES

1. Question: Proper disposal of hazardous wastes is a major problem. A March, 1983, OTA report "Technologies and Management Strategies for Hazardous Waste Control" concluded that all hazardous waste landfills will eventually leak. The same report added that 90% of EPA's hazardous waste research budget goes for various aspects of land disposal.

A. Why is there such an unbalanced emphasis on land disposal vs. the other disposal options?

Answer: EPA's hazardous waste research budget for FY 1985 is approximately $34.8 million. Of this total, approximately $5.1 million or 15 percent is dedicated to land disposal. The remaining resources are dedicated to the following areas: incineration $3.2 million; alternative technologies $3.1 million; land treatment of wastes $1.6 million; releases of hazardous materials $1.9 million; dioxin $2.7 million; disposal of high hazard wastes $1.1 million; risk assessment $7.1 million; waste identification and measurement $7.0 million; and quality assurance $1.9 million. Although research supporting land disposal does not begin to total 90 percent of the overall program, ORD and the program office have jointly agreed to the level of support that is planned for this area because of the large number of landfills expected to apply for permits under RCPA.

HAZARDOUS WASTE

B. Question: H.R. 2899, which passed the House last month, mandates that at least 25% of the hazardous waste research be in other technologies besides land disposal. What are EPA's research priorities in alternative technologies?

Answer: Priorities within the hazardous waste research program have been established to accelerate the evaluation of existing and emerging technologies that can be used for the treatment of hazardous wastes, which will probably be banned from landfills and cannot be economically disposed of by conventional incineration. The technologies selected for evaluation will either serve as ultimate disposal for the waste or as "pretreatment" before land disposal. Technologies to be evaluated fall into the general classification of chemical, biological, physical, and advanced thermal. Examples of these categories are as follows: chemical: wet air oxidation, ozonation, alkali polyethylene glycol (APEG); biological: yeasts, fungi, genetically altered bacteria; physical: steam/air stripping, membranes; advanced thermal: high temperature, fluid wall reactor (pyrolysis in absence of oxygen), plasma arc, and radio frequency. Technologies selected must be able to render the wastes innocuous with particular attention to control of air emissions during and after the disposal process.

HAZARDOUS WASTES

2, A. In the future, will EPA consider risk analysis of long-term impact in evaluating alternative disposal technologies?

EPA is currently using risk analysis techniques to evaluate alternative disposal technologies. The Office of Solid Waste has developed an analysis model which evaluates the risks and costs for various treatment, transportation, and disposal waste management practices. We are reviewing this model and expect to use it assessing broad policy questions. In addition we also use risk models to ensure that our regulations provide an adequate level of safety.

2. B. In analyzing alternative technologies, will long-term cost and health effects receive greater emphasis in the future?

The Resource Conservation and Recovery Act (RCRA) and current versions of the RCRA amendments do not explicitly allow EPA to consider cost in policy and regulatory decisions. They require us to issue standards that protect human health and the environment regardless of the cost. In carrying out these responsibilities, we will analyze the alternative technologies to ensure that they will not pose an unreasonable risk over the long-term as well as the short-term.

19. Monitoring

QUESTION #1

The Science Advisory Board of the International Joint Commission of Canada and the United States has reported that the atmosphere is now the major source of toxic contamination of the Great Lakes, and it has been suggested that the atmosphere is a major supplier of toxic chemicals throughout the country.

A. Do you intend to set up a monitoring program to measure potentially toxic pollutants in air, land and water? If so, how? And when?

ANSWER

As a result of EPA's Environmental Monitoring Task Force and the Environmental Monitoring Policy which resulted from the Task Force, each program office has prepared draft environmental monitoring strategies. These draft strategies include approaches for monitoring for toxic pollutants in air, land, and water. These draft strategies are being reviewed within EPA and have been sent to the State organizations for review. The final strategies are due May 25, 1984. Once the strategies are final we will be able to provide more definitive answers as to what monitoring programs will be established for toxic pollutants in air, land, and water. We will also be able to provide information on how and when.

Even when final strategies are available, limitations will likely exist because monitoring for toxic pollutants is very resource-intensive. The monitoring strategies are long-term and not all of the monitoring for toxic pollutants can be implemented at once.

B. Why did the Agency shut down the inhalable particulate network?

ANSWER

The Agency continues to operate 20 sites of the original inhalable particulate network. These sites are ones recording the highest levels of particulates. We are refurbishing the other monitors that have been in the field. The refurbished monitors will be returned to the field for States to operate. In addition, we are in the process of procuring additional equipment for States to use in establishing inhalable particulate networks. The equipment being provided to the States will be used to establish two types of stations, one the State and Local Air Monitoring Stations (SLAMS) and the second, the National Air Monitoring Stations (NAMS). This new monitoring system will be substantially larger and more comprehensive than EPA's initial inhalable particulate network.

QUESTION #2

In the mid-1970's, a National Academy of Sciences' review of EPA monitoring programs said: "The nation's information on environmental quality is bad."

A. Describe what EPA has done over the past 7 or 8 years to improve this situation; do not just recite meetings held and exhortations made: provide examples of information on environmental quality that is good, and explain why it is good -- if there are any such examples.

ANSWER

We have taken several actions following the recommendations of the National Academy of Sciences' review of EPA's monitoring programs. In all EPA program offices, at least some actions have been taken or are underway to improve the scientific reliability of our monitoring, integrate data bases, and coordinate with other Federal agencies and States.

The following are some examples of sound environmental quality information which we have obtained through our monitoring programs.

- We know that the air over most urban areas has become cleaner over the past several years. Concentrations of the criteria pollutants (ozone, sulfur dioxide, carbon monoxide, nitrogen dioxide, and total suspended particulates) have been reduced significantly or remain below the established standards. We determined these trends through analyzing the data obtained from the monitoring networks EPA requires the States to operate.

  EPA promulgated regulations regarding air quality monitoring which specify the following:

  - Provides for fixed and movable monitoring sites
  - Establishes uniform instrument siting criteria
  - Requires a quality assurance program
  - Imposes an annual review of a State's ambient air quality monitoring program
  - Requires daily public reporting of an air quality index
  - Provides for the periodic reporting of air quality data and quality assurance information

  The data from this air monitoring network is collected using well-documented methods for data collection, data handling, analysis, and quality assurance (including reporting of precision and accuracy values with the data), and is reported on a regular basis. The data is scientifically sound and of consistently good quality.

- Using sport fish and other selected fish species as indicators of biological status, we designed and implemented a comprehensive survey of the nation's waters called the Aquatic Life Survey. Analysis of the survey data shows that the ability of the nation's waters to support sport fish has not changed appreciably during the last 5 years. Sixty-seven percent of all waters exhibit at least a minimum ability to support sport fish or species of special concern. Overall, 91% of the streams have maintained their ability, while 5% have been degraded and 4% have improved.

  This work is part of our efforts to improve the statistical reliability of data collected for national assessments. This particular effort resulted in a process for developing statistically valid, unbiased estimates of biological conditions of our nation's waters.

We are continuing to work to improve the quality of our environmental data. EPA's Quality Assurance staff will soon finalize a plan for working with the program offices to determine their respective data quality objectives. From this effort, we will be in the best position to assess how well current monitoring programs meet the specified data quality objectives for each of the programs and to carry out the needed actions for our monitoring programs to meet those objectives.

B. You have created an "Environmental Monitoring Task Force." What is the status of the Task Force? Explain why this Task Force is not just another study: Give concrete examples of its accomplishments, including examples of information improvements.

ANSWER

We believe EPA's Environmental Monitoring Task Force was very successful. The Task Force achieved its objectives and has set the Agency firmly on a course towards improving the quality and effectiveness of its monitoring programs.

When EPA's Deputy Administrator created the Task Force in August 1983, he gave it 3 specific tasks:

1. Develop an Agencywide Environmental Monitoring Policy.
2. Develop guidance for programs' development of monitoring strategies.
3. Provide options for the Deputy Administrator to consider regarding establishing a mechanism for coordinating and integrating monitoring activities.

The Deputy Administrator directed the Task Force to build upon the work which had already been done both within and outside EPA to identify monitoring problems. By focusing on the 3 tasks assigned to it, the Task Force has clearly been action-oriented.

On December 23, 1983, the Deputy Administrator issued the Agency's first Environmental Monitoring Policy. This policy outlines the goals and objectives of the Agency's monitoring programs, which are to:

- Meet the full range of current and future Agency needs for environmental data.
- Ensure that monitoring is technically and scientifically sound.
- Ensure environmental monitoring data are managed to facilitate both access and appropriate use in Agency decision making.
- Ensure effective and coordinated Agencywide processes for planning and execution of monitoring activities.
- Ensure that roles and responsibilities are clear regarding monitoring management and implementation by EPA and State officials.

On January 16, 1984, the Deputy Administrator issued the guidance for programs to use to develop their monitoring strategies. The programs submitted drafts of their strategies for Agencywide review on April 4. On May 25, the programs will submit their final monitoring strategies to the Deputy Administrator.

Each monitoring strategy must address:

- explicitly what our environmental data needs are;
- what environmental data we are collecting;
- what the data gaps are in what we currently monitor;
- what we need to do to correct these information deficiencies; and
- ways we can coordinate monitoring efforts across programs.

This is the first time we will have such information organized into a single document. Having this information in hand will allow us to develop well-planned, coordinated, and effective Agency monitoring programs. The monitoring strategies and plans will be reviewed on a regular basis and updated as needed.

In addition, the Deputy Administrator is designating a permanent office within EPA to coordinate monitoring activities across Agency programs. Having this focal point will ensure that efforts to improve the quality of our environmental monitoring receive appropriate management attention, remain on track, and achieve the desired results.

Our current efforts, for which the Task Force has been the keystone, will ensure that recommendations and plans will be followed through by establishing accountability and reviewing progress in implementing recommendations. In the past, many recommendations were never carried through largely because we had no established mechanism for tracking implementation. We require the program monitoring strategies to contain specific plans and schedules. Through our Strategic Planning and Management System, we have instituted the means to track these commitments and hold program managers accountable.

QUESTION #3

EPA has been monitoring the environment for over a decade, yet we are still faced with unpleasant surprises like the EDB problem and the realization that most of the pollution added to the Great Lakes today is deposited from the atmosphere.

A. What does our environmental monitoring system tell us about whether the environment is becoming cleaner and safer?

ANSWER

Results from our monitoring system show improvements in environmental quality in several key areas over the last few years, but also identify areas with a degrading environment. For example, EPA's Office of Air and Radiation annually publishes the National Air Quality and Emissions Trends Report based on millions of individual data points. Some findings in the report published in April, 1983 were that national long-term (1975 through 1981) improvements can be seen in sulfur dioxide (SO_2), carbon monoxide (CO), and lead (Pb).

Specifically, annual average SO_2 levels measured at 416 sites with continuous SO_2 monitors decreased 27 percent from 1975 to 1981. A similar decrease of 31 percent was observed in the trend in the composite average of the second maximum 24-hour average. An even greater improvement, a decrease of 84 percent, was observed in the estimated number of exceedances of the 24-hour standard.

Additionally, the second highest non-overlapping 8-hour average CO levels at 224 sites decreased at a rate of approximately 5 percent per year, with an overall reduction of 26 percent between 1975 and 1981. An even greater improvement was observed in the estimated number of exceedances, which decreased 84 percent.

Another report, the National Water Quality Inventory, based on water quality data is submitted to Congress biennially. Conclusions from the report published February 1984 include:

- o EPA studies and sampling efforts show that current best practicable treatment (BPT) discharge limits and existing BPT permits are removing significant amounts of a number of toxic organic chemicals and heavy metals from industrial discharges.
- o Trend information from the 1982 State Section 305(b) reports reveals that progress has been made in control of water pollution in many States. Twenty-one of the 35 States reporting overall trend information cite generally improving water quality trends.

EPA has also monitored the extent of drinking water contamination. A nation-wide random sample of about 500 of public water systems with ground-water sources was selected, and their water was analyzed for volatile organics. The results showed that about 1/2 of one percent had levels of these chemicals exceeding 50 ppb. Of the larger systems sampled, those serving over 10,000 people, about 6.6 percent, had levels over 5 ppb compared to about 2.8 percent in smaller systems. These measurements can help EPA focus its regulatory eforts.

Monitoring data are essential for managing our programs. They can tell us whether our programs are working as well as they should and identify environmetnal problem areas needing attention.

B. Is the current monitoring system adequate to provide the minimum necessary information to design effective control strategies for toxic pollutants?

ANSWER

Monitoring for toxic pollutants is perhaps our weakest area of monitoring. Monitoring for toxics usually requires very sophisticated analytical techniques, more resources, and highly skilled personnel. Also toxics problems are often very localized. The program offices are addressing the problems of toxics monitoring in their monitoring strategies. Final strategies are due May 25, 1984.

C. Do you recommend changes in the current system of environmental monitoring or its management? Can industry play a larger role?

ANSWER

At this time we do not recommend changes in the current system of environmental monitoring or its management. The Agency has recently made significant changes and we need time to see how well these changes work before making further changes. For the first time the Agency has an Environmental Monitoring Policy, specific guidance for programs to use in developing monitoring strategies, and is creating a permanent organizational focal point for overseeing and managing the Agency's monitoring.

With respect to interagency coordination, we are working with the Council on Environmental Quality (CEQ) on an effort to develop an inventory of Federal monitoring programs. This effort builds on the CEQ March 21, 1980 report Interagency Task Force on Environmental Data and Monitoring and will develop plans for addressing selected interagency problems.

We already use considerable amounts of industry monitoring data in our regulatory and compliance monitoring activities. It is likely that industry could play an even larger role. We will be investigating this possibility as we improve our monitoring programs.

D. What are your thoughts on how EPA can promote and enhance environmental monitoring globally?

ANSWER

One of the best ways for EPA to promote and enhance environmental monitoring globally is through technology transfer. By maintaining our strong technological lead and making available our technology to other countries, we believe we can enhance monitoring globally.

E. WHAT IMPACT WOULD A U.S. WITHDRAWAL FROM UNESCO HAVE ON GLOBAL ENVIRONMENTAL MONITORING PROGRAMS? IF WE DO WITHDRAW FROM UNESCO, WHAT ENVIRONMENTAL PROGRAMS COULD "TAKE UP THE SLACK?" WERE YOU CONSULTED BY THE STATE DEPARTMENT ON THE IMPACT TO ENVIRONMENTAL PROGRAMS OF A U.S. WITHDRAWAL?

ANSWER: EPA is currently participating in two UNESCO-related global environmental monitoring activities: human exposure monitoring and background ecosystem pollutants monitoring. We do not believe that U.S. withdrawal from UNESCO will have any immediate impact on either of these activities, because funding for these activities comes either directly from the Agency's budget or from the UN Environment Program's Global Environmental Monitoring System (GEMS). The State Department has consulted us regarding the impact of U.S. withdrawal from UNESCO on the above activities; Department officials have informed us that as long as the U.S. is able to participate in the Man in the Biosphere Program (MAB) they do not anticipate any impact on these activities.

20. Ocean Dumping and Ocean Pollution

ANSWER TO QUESTION 1.A.

The United States policy on this matter is contained in the Marine Protection, Research, and Sanctuaries Act of 1972, as amended. The Act states that high-level radioactive waste is prohibited from dumping and that low-level radioactive waste may not be dumped without a permit from the U.S. Environmental Protection Agency and subsequent approval by the Congress. No permits have been requested since passage of the Act. Therefore, the U.S. Environmental Protection Agency has not taken a position on the merits of dumping of any particular low-level radioactive waste, such as decommissioned nuclear submarines.

ANSWER TO QUESTION 1.B.

The Nuclear Waste Policy Act of 1982 prescribes a U.S. Government program leading to the disposal of high-level radioactive wastes in mined geological repositories on land by 1998. The Nuclear Waste Policy Act also mandates that research on disposal methods in addition to geological disposal on land be carried out by the Department of Energy (DOE). The DOE has been conducting such research as part of an internationally-sponsored program on a backup concept involving emplacement of the waste canisters in deep seabed clay formations that have been stable for millions of years. However, the state of the research is such that a conclusion as to the feasibility or viability will not be available for about ten years, even if feasible use of this concept could not occur until after the year 2000.

At the last meeting of the Contracting Parties to the London Dumping Convention, the Parties could not agree whether or not sub-seabed emplacement is currently permitted. However, there was a consensus agreement on the following:

- o "The Consultative Meeting of the Contracting Parties to the London Dumping Convention is the appropriate international forum to address the question of the disposal of high-level radioactive waste and matter into the sea-bed, including the question of the compatibility of this type of disposal with the provisions of the London Dumping Convention;"
- o "No such disposal should take place unless and until it is proved to be technically feasible and environmentally acceptable, including a determination that such waste can be effectively isolated from the marine environment, and a regulatory mechanism is elaborated under the London Dumping Convention to govern the disposal into the sea-bed of such radioactive waste."

Question:

(2) At-sea incineration ships (e.g., the VULCANUS) have conducted several successful test burns of hazardous wastes at sea in the past two years.

A. What have these tests shown regarding the at-sea incineration technology? Is at-sea incineration a viable option for waste disposal? For what types of wastes? How will EPA license such ships? How will EPA monitor such burns?

Answer:

(2) A. Results of monitoring 13 individual incineration cruises during the past 10 years have indicated that oceanic incinerators perform at efficiencies comparable to land-based hazardous waste incinerators, i.e., greater than 99.9 percent combustion efficiency and greater than 99.99 percent destruction efficiency of individual principal organic hazardous constituents. Environmental monitoring studies performed during the past 10 years indicate no adverse impact on the marine environment from these activities.

Based on the above data, it appears that incineration at sea is a viable technology for destroying a significant portion of the Nation's Growing Inventory of hazardous wastes, specifically combustible liquid organic hazardous wastes. The Agency is conducting an Incineration Study to evaluate the current and future roles of both land and oceanic incineration as technologies for dealing with these hazardous wastes.

EPA will propose Incineration At Sea Regulations by August 1984, and after public comment, promulgate regulations by the early part of 1985. Draft permits will be based on these regulations. After opportunity for public participation on draft permit determinations, final permits to operate incineration vessels will either be issued or denied.

EPA envisions that the Permittees will be required to take the lead in performing self monitoring for any incineration activity. This will be supplemented by EPA and NOAA as required. Permittees are required through self monitoring to ensure that all terms and conditions of the permits are being met. EPA and the Permitttees are jointly responsible through monitoring programs for ensuring that no adverse environmental impacts are occurring from the activities.

Question:

(2) B. Is an incineration ship permitted to move from a U.S. port into international waters to burn toxic wastes? Under what laws and regulations are such "burns" regulated?

Answer:

(2) B. Incineration ships are permitted to load hazardous wastes in U.S. ports and move into international waters (at appropriately designated incineration sites) to incinerate the cargo. This activity is currently regulated under the Agency's Ocean Dumping Regulations (40 CFR 220-228) (authority Marine Protection, Research, and Sanctuaries Act) and will be regulated under specific Ocean Incineration Criteria and Regulations when they are finalized, scheduled for early 1985.

Question:

(3) A. Over the past two years, EPA has received hundreds of requests from Applicants (sewage authorities) who wish to bypass secondary treatment of sewage sludge under waivers authorized by section 301(h) of the Clean Water Act?

A. What impact will this program have on marine pollution levels?

Answer:

(3) A. Waivers authorized under Section 301(h) of the Clean Water Act are granted only when scientific evidence shows that the discharge will not affect the balanced indigenous population. Therefore, we feel that any waivers granted under this provision will not impact marine pollution levels.

3. Question: Over the past two years, EPA has received hundreds of requests from applicants (sewage authorities) who wish to bypass secondary treatment of sludge under waivers authorized by Section 301 (H) of the Clean Water Act.

B. What impact will this program have on your research priorities?

Answer: Funding for research on the impact of outfalls has been relatively constant from FY 1983. It was $1.4 million in FY 83, $1.5 million in FY 84 and $1.4 million is proposed for FY 85. This level was maintained despite generally falling over-all budget levels, and reflects the high priority of this work to EPA. The program is oriented towards producing methods of assessing the impacts of proposed ocean discharges and field validating these methods. The methods are then used by the program office in deciding whether to grant 301 (H) waivers. The research program also provides direct assistance to the program office in particularly difficult permit evaluations.

21. PESTICIDES

1. While many states and the District of Columbia have adopted the Federal standards for EDB, others such as New York and five other states in the Northeast have adopted far more stringent guidelines. Some states have chosen simply to monitor the situation before deciding on guidelines.

   A. What direct assistance is EPA providing to the States in the form of surveys of EDB contamination, research results and expert advice? How much care is taken to ensure that the same information and advice is supplied to all the States? Please describe the mechanisms which provide this quality control.

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   EPA has made a considerable effort to coordinate with the States throughout the EDB regulatory actions and has attempted, through information exchange and establishment of tolerances and recommended residue levels, to set a national course. On January 13, 1984, Administrator Ruckelshaus wrote to all state governors requesting their assistance in gathering data on EDB residues in foods. Accompanying this letter was a recommended sampling procedure, and information on an acceptable method for chemical analysis of EDB residues in foods.

   In connection with the EDB decisions of September 28, 1983, February 3, and March 2, 1984, the Agency provided scientific background documents to all the state agencies responsible for pesticide regulation. The Agency also provided face-to-face briefings to explain the scientific and regulatory bases for the EDB decisions for representatives of state agricultural and health agencies. In short, the Agency made a considerable effort to provide adequate and consistent information about our concerns and actions relating to EDB to the individual states. We have also established a task force of EPA and state health officials to provide a forum for discussing continuing aspects of the EDB situation.

   It should also be noted that FDA has established an electronic mail system which enables all individual states reporting on EDB sampling results to share each others findings. Also, as of mid-April only three states (New York, Maine and Massachusetts) have set EDB residue standards for grain products lower than EPA's recommended maximum acceptable levels. A few states which have adopted EPA's recommendations for most products, have also set a standard of no-detectable levels in babyfood.

B. What efforts is EPA currently making towards achieving a national concensus on standards for pesticide contamination of food? What organizational or legislative changes are desirable, in your view to achieve such a national consensus?

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In relation to EDB, a broad concensus has been achieved in that only a few states chose to establish standards different from the Agency's recommendations. In relation to pesticides in general, the existing federal tolerance system has been accepted by the states, and in fact, the international community, for many years. A tolerance is established on the basis of health effects and and residue data in order to establish an enforceable residue level which will protect the health of food consumers. Pesticide residues in excess of established tolerances, or for which no tolerance has been established render a commodity adulterated under the Federal Food, Drug and Cosmetic Act, and it may be withheld from commerce by FDA or USDA.

In general, the tolerance system is a reasonable and effective national system for regulating pesticide residues in food commodities and for preventing excessive and potentially hazardous dietary exposure to pesticides. It should be recognized that EDB presented an unusual case because the chemical had been exempted from the requirements for a tolerance in 1956 when the health hazards of EDB were not known, and residues of EDB could not be detected in foods and were thought not to exist. Changes in technology and available information are difficult to anticipate. However, the Agency does have authority under section 3(c)(2)(B) of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) to require pesticide registrants to provide additional data needed to evaluate the risks and benefits of pesticide products. For example, we are using this authority to require additional data on several grain and citrus fumigants which, like EDB, were exempted from tolerance requirements in the past.

C. What part can new research and additional monitoring play in resolving the uncertainties we now face in developing national guidelines?

- - - - -

Monitoring for pesticide residues in food commodities is an essential part of ensuring compliance with established tolerances and of guarding against contamination incidents. FDA and USDA programs already monitor domestic and imported food commodities for these purposes. EPA is now in the process of developing a National Monitoring Plan for pesticides which will include efforts by this Agency to gather data on pesticide residues in food, air, water, and soil as well as exposure occurring through the domestic use of pesticide products. Such monitoring activities will improve our understanding of the nature and extent of human exposure to pesticides.

2. Question: The FY 1985 budget request for pesticide research is only $6 million. Yet a recent National Academy of Sciences report concluded that the level of information on pesticides necessary to make even a partial assessment of the hazard to human health exists for only 34 percent of these chemicals.

A. With such a small research budget, how can EPA conduct the research necessary to adequately determine the long-term health impact of pesticides?

B. What research programs are underway that might lead to alternatives to chemical pesticides?

Answer:

A. The FY 1985 budget request for pesticides research is in excess of 8 million dollars. This request represents an integrated effort for health research, environmental processes and effects research, environmental engineering and technology research, health assessments, and monitoring systems and quality assurance support. The request represents an increase of 28% over FY 1984 levels and provides adequate support for current FIFRA requirements.

B. EPA's health and environmental processes and effects research programs are conducting research on biorational pesticides (such as pheromones, juvenile hormones, viruses, bacteria, etc.). These "pesticides" serve as alternatives to conventional chemical pesticides. The FY 1985 resources planned for this effort total $781.3K.

22. Toxic Chemicals/Dioxin

Q.1 The EPA has authority under TSCA (Toxic Substances Control Act) to regulate workplace exposure to toxic chemicals and to impose permanent regulatory controls on chemicals through Significant New Use Rules (SNURs). Recently, the Administrator for Information and Regulatory Affairs at OMB indicated that the SNURs approach "seems inconsistent" with EPA's Risk Assessment and Risk Management Policy.

A. Do you agree with the statement in the OMB letter to the EPA Administrator dated November 7, 1983 that "In each of the SNURs we have just reviewed...the apparent objective of the rules is to regulate chemical exposure down to "no effects" level of risk--making "worst case" assumptions in each stage of analysis and adding a "safety factor" at the end"? Please explain.

B. Do you intend to restrict the SNURs program in response to OMB's pressure?

A.1.A We advised OMB that we believed they had misunderstood to some degree the nature of EPA's judgment in determining the need to limit risks from chemicals just entering the marketplace.

We believe our use of section 5 controls demonstrates a careful balancing of the desire not to discourage innovation with the need to minimize potential adverse human and environmental effects.

A.1.B We do not intend to restrict the SNUR program. The use of SNURs and section 5(e) orders is an essential element of our testing program to carry out Congressional intent for new chemicals. In enacting TSCA, Congress chose not to require a full testing requirement for all new chemicals. It did give the Agency authority to regulate new chemicals of potential concern when there is insufficient data to evaluate potential risks.

The Agency must review most new chemicals without health and environmental effects test data and without any direct monitoring data on which to predict the potential exposure of humans or the environment. In the absence of such data, EPA has found it necessary to estimate "reasonable worst cases." Where reasonable worst case analysis suggests a potential for significant risk, EPA believes the prudent approach is to limit exposure until data necessary to assess risks accurately are developed. Manufacturers always have the option of submitting data to indicate that the Agency's assumptions were faulty.

We are attaching, for your information, a copy of the letter the Agency sent to OMB.

DEC 9 1983

Honorable Christopher C. DeMuth
Administrator for Information and Regulatory Affairs
Executive Office of the President
Office of Management and Budget
Washington, D.C. 20503

Dear Chris:

This letter is in response to your November 7, 1983 letter concerning four Significant New Use Rules (SNURs) and the Premanufacture Notice (PMN) Review program. We believe that you have misunderstood to some degree the nature of EPA's judgment in determining the need to limit risks from chemicals just entering the marketplace. As discussed more fully below, we believe our use of section 5 controls demonstrates a careful balancing of the desire not to discourage innovation with the need to minimize potential adverse human and environmental effects. We do not believe that regulation under section 6 or by OSHA is the appropriate mechanism for control of new chemicals.

The use of SNURs and section 5(e) orders or negotiated agreements is a major and essential element of our program to carry out the intent of Congress that EPA address the risks posed by new chemicals before commercialization and thus before human and environmental harm may occur. The nature of our new chemical review program is shaped in large part by the relative scarcity of data on new chemicals. In enacting TSCA, Congress decided not to adopt an across-the-board testing requirement for all new chemicals, but provided EPA with authority under section 5 to regulate new chemicals of potential concern in the absence of data sufficient to evaluate potential risks. As a result of these provisions, the Agency must review most new chemicals without health and environmental effects test data and without any direct monitoring data on which to predict the potential exposure of humans or the environment. In the absence of such data, EPA has found it necessary to estimate "reasonable worst cases." Where reasonable worst case analysis suggests a potential for significant risk, EPA believes the prudent approach is to limit exposure until data necessary to assess risks accurately are developed. Manufacturers always have the option of submitting data to indicate that the Agency's assumptions were faulty.

The Agency has not been excessively conservative in applying its worst case approach or in implementing the PMN program. The Agency has taken formal and informal regulatory action only when necessary to protect public health or the environment. Many of the actions EPA has taken have allowed the manufacture of the new chemical, provided relatively inexpensive controls are used to limit exposure (either pending the development of data or in lieu of testing). Given the degree of uncertainty that exists in new chemical review, this history does not reflect a regulatory posture that seeks to achieve "zero" risk. Instead, we have allowed society to obtain the benefits of the chemicals in a way that we believe will not lead to unreasonable risks.

Where data are insufficient for a reasoned evaluation of the risks but available controls exist to reduce risks, the use of section 5(e) and 5(a)(1)(B) authorities is appropriate. Whether new chemical manufacturers choose to use controls for an extended period of time or to develop data to evaluate the necessity of the controls is based on economic and other factors. In some cases, data have been developed at early stages of commercialization. In other cases, manufacturers have chosen to use controls, at least until the commercial viability of the chemical has been determined. The flexibility provided by the section 5(e) and SNUR approach protects the interests of society and of the manufacturers. In fact, failure of EPA to take action at an early stage may lead to much more costly control requirements in the future as well as significantly greater risks.

As a general rule, we do not believe that section 6 would meet our objectives or the intent of Congress in these cases. Section 6 requires a finding that a chemical "will present" an unreasonable risk. Since a general lack of data on new chemicals results in considerable uncertainty, section 6 is not an adequate tool to address our concerns in the vast majority of cases. Thus, except in rare instances, reliance on section 6 would simply fail to carry out the Congressional intent to prevent unreasonable risks before they occur.

Finally, we do not believe that EPA should defer to OSHA with respect to occupational risks posed by new chemicals. I agree that we should take advantage of existing regulatory programs. However, the Occupational Safety and Health Act is not designed to handle the uncertainties inherent in dealing with new chemicals, and the Occupational Safety and Health Administration (OSHA) does not have a program for handling new chemicals. OSHA is authorized to regulate substances that pose "significant risks in the workplace." This is a standard comparable to section 6 of TSCA and is equally inappropriate for addressing uncertainties associated with new chemicals. You mentioned specifically OSHA's comprehensive chemical labeling regulation and suggest that this rule precludes the need for EPA to specify what labels are appropriate. We have coordinated with OSHA concerning the use of EPA-required labels. OSHA has indicated that compliance with EPA labeling requirements would constitute compliance with their labeling rule. We will continue to keep abreast of regulatory developments promulgated under statutory authorities other than TSCA and to rely on their provisions or coordinate our activities as appropriate.

Thank you for your comments.

Sincerely yours,

/S/ BILL

William D. Ruckelshaus

2A. What is the current status of the Dioxin Monitoring Program?

EPA is in the implementation phase of the National Dioxin Study. The Office of Solid Waste & Emergency Response (OSWER) is focussing on production facilities (tiers 1 & 2) while the Office of Water is focussing on pesticide formulators, use sites, combustion sources and ambient concentration (tiers 3 - 7). Overall coordination is provided by the Dioxin Management Coordinator.

We have identified most, if not all, of the production facilities. We have sent survey letters to these facilities and have conducted preliminary screening investigations. We have also compiled a preliminary list of disposal sites (tiers 1a & 2a) associated with these production facilities.

We are revising sampling and analysis guidance materials for tiers 3 - 7. These documents will be subject to peer review to ensure data quality and consistency for this national study. We have identified potential sites in all tiers and are in the process of selecting sites for sampling.

In tier 4, which covers combustion sources, we are conducting an extensive literature search to identify testing done to date. We are in the process of identifying source categories most likely to emit dioxins. We are working closely with the Canadian Government which has a strong interest in combustion sources.

We expect to begin sampling at tiers 3 - 7 in the summer. We will pace our sampling and analysis efforts over the 2 year timeframe of the study.

2B. If additional sites of dioxin contamination are detected, what clean-up and disposal actions will EPA undertake?

The Dioxin Strategy states that if dioxin comtamination is detected at a site in Tiers 3 to 6 the data will be forwarded to the Office of Solid Waste and Emergency Response for further evaluation as part of the Superfund program.

OSWER will work closely with the U.S. Center for Disease Control (CDC) in assessing the need for removal or remedial activity. Such action, as may be necessary, will proceed following standard Superfund program and enforcement procedures.

In the case of a remedial activity, the specific clean-up/ disposal alternative would be selected based on the site specific remedial investigation/feasibility study (RI/FS). In practice, the RI/FS's completed to date on dioxin have not been able to recommend fully satisfactory long-term destruction or disposal options for all contaminated wastes at the sites under consideration. In such cases, interim storage or containment in place combined with the elimination of public access are serving as temporary solutions.

EPA has accelerated its research program to develop permanent destruction/detoxification technologies. Promulgation this summer of our dioxin listing under RCRA will establish the basis for RCRA approved dioxin disposal and incineration practices.

2C. Does EPA plan to establish action levels for maximum dioxin contamination in water? Please explain.

EPA is required to publish Water Quality Criteria document for various pollutants. EPA published a Water Quality Criteria document for dioxin in February 1984. This document is for use by States in establishing water quality standards.

EPA will use the information in the Water Quality Criteria document in reviewing the results of our sampling activities in the National Dioxin Study.

2, 3, 7, 8 TCDD is essentially insoluble in water. Based on its insolubility and on sampling efforts to date, we expect to find little or no contamination. If for some reason we detect measurable levels of dioxin, we will work with CDC to develop an appropriate response.

2D. What are the long-term plans for using contaminated sites such as Times Beach, Missouri?

Long-term plans for acquired properties such as Times Beach and the Minker-Stout residence areas in Missouri will rest with the State. Acquisition of these lands, which is managed by the Federal Emergency Management Agency, will result in title to the property being vested with the State. The State is obligated to manage and use these properties in a manner consistent with their maintenance requirements.

In the case of Times Beach many different possible uses have been considered, including creating a park or an airport. Superfund money would not be available for this purpose. Further, should the State decide to sell the property, 90 percent of the proceeds would have to be paid to the Federal Government. This would help defray the Federal share of the earlier purchase and clean-up costs.

EPA anticipates that most dioxin comtaminated sites will be cleaned-up with ownership remaining in private hands. Planning for future uses of such sites will be a private decision subject only to any constraints such as operation, maintenance and monitoring requirements that may result from the clean-up activities.

3.A. Question: Currently, what research programs does EPA have underway to develop permanent dioxin disposal technology?

Answer: The hazardous wastes research program, in cooperation with the Office of Solid Waste and Emergency Response, currently is accelerating its Dioxin - Engineering research program to address: (a) the question of mobility of 2,3,7,8-tetrachloro-dibenzo-p-dioxin (TCDD) in soils; (b) the utility and economic feasibility of soil stabilization techniques using geotextiles, special asphaltic mixtures and cements for soil fixation, and long term storage in abandoned mines; (c) chemical detoxification methods employing alkali polyethylene glycolates (APEG) and ultraviolet photolysis; and we will be evaluating the effectiveness of the EPA mobile incinerator in the destruction of dioxin-contaminated liquids and soils.

J.B. Question: Is EPA conducting research into alternative technologies to land disposal?

Answer: The hazardous waste research program has a comprehensive program that is developing and evaluating alternative technologies to land-disposal. Examples include:

a) thermal destruction processes

incineration, industrial co-firing processes (boilers, kilns), wet air oxidation, plasma arc, high temperature fluid wall reactors, molten salt, fluidized bed.

b) biological destruction

in-situ detoxification (e.g., special yeasts, fungi, and genetically altered bacteria) industrial treatment processes

c) chemical destruction

ultraviolet photolysis, in-situ dehalogenation of soils with radiofrequency heating and chemical reagents, such as alkali polyethylene glycols (APEG).

d) physical methods

chemical fixation, chemical encapsulation

4. Question: Testing methods for the human health effects of chemicals regulated under TSCA (Toxic Substances Control Act) are generally recognized to be unsatisfactory due to lack of reliability, high cost, and the length of time required for animal testing. Yet the budget for health effects under TSCA is only $7 million for FY 1985 and shows no real increase from FY 1984.

A. In view of the high public concern over the health effects of toxic chemicals in the environment, why is this program funded at such a low level?

B. Is there an active search underway for better and cheaper testing methods?

C. Is the testing program reviewing serious health effects other than cancer -- reproductive effects and neurological disorders, for example?

Answer:

A. The FY 1985 request is for $10.8 million. We feel that this amount will enable us to enhance our efforts in developing test methods.

B. Yes. We have a research program underway which addresses the development of better and cost-saving methods. This program calls for developing methods to detect and characterize adverse health effects as well as developing test models to assess risks from toxic substances.

C. Yes. Additional research is conducted in the areas of biotechnology, epidemiology, immune system toxicity and inhalation toxicology.

Q.5.A Since the Toxic Substances Control Act is designed to place the burden of testing chemicals on industry, describe how you decide when to do research on a chemical yourself and when you place the responsibility on the producer; give examples.

B Has EPA ever used TSCA authorities to require industry to produce information on a chemical because of the regulatory needs of another Federal agency, for example OSHA? Give examples, if so; if not, why?

A.5.A The burden of testing under TSCA is borne by chemical manufacturers. As a result of EPA's actions, manufacturers have submitted hundreds of scientific studies which the Agency uses to identify and control chemical risks. In addition to the studies received to date, an additional 600 scientific studies are underway or are scheduled. The chemical industry has sustained the full cost of all this testing.

EPA must always keep in mind the difference between testing and research. Under TSCA's section 4, the Agency can require testing by manufacturers of specific chemicals or categories of chemicals using defined test methodologies or protocols.

It is important to note that EPA does conduct research on chemical substances. EPA's research in this instance, however, is focused on development and validation of test methods.

Research may deal with either development of general testing methods or, where a specific chemical cannot be tested for lack of a suitable or standard method, the development of a specific test methodology. EPA's test methods are designed to yield scientifically defensible results. The chemical industry then carries the burden of testing individual chemicals using EPA-developed test methods.

A.5.B EPA has considered the needs of the Occupational Safety and Health Administration (OSHA) in gathering data, but has not yet required industry to produce information on a chemical solely because of the regulatory needs of another Federal agency.

For example, in the final section 8 rule requiring asbestos manufacturers and processors to report their production, use and release activities (July 30, 1982), EPA said this information, including any Confidential Business Information (CBI), would be available to OSHA. Since then, OSHA has been cleared to use EPA asbestos CBI data.

Our activities under section 4 have been focused on responding to recommendations from the Interagency Testing Committee (ITC).

We agree with the implicit suggestion in your question that we should use TSCA's authorities to meet the needs of other Federal agencies.

Now that the ITC backlog has been eliminated, we plan to require testings to meet the needs of other EPA offices and Federal agencies. In addition, we will use the section 8 information gathering authority if another Federal agency expresses a need for the data.

Q.6 How does EPA intend to provide a substantial, accurate and thorough data base for toxic chemicals in the air, on land and in the water?

A.6 Under the Toxic Substances Control Act (TSCA), EPA has a number of ways to receive chemical information. The Agency receives information through test data generated by chemical manufacturers, through TSCA's information gathering authorities, and through voluntary submissions from chemical manufacturers and trade associations.

When EPA receives test data and other chemical information from a chemical manufacturer through either rulemaking or negotiated testing agreements, the Agency publishes in the Federal Register information concerning the receipt of testing data, studies and other data from chemical manufacturers. All Agency information gathered under TSCA is public information available to anyone upon request. Of course, confidential business information is protected from public release.

In addition to publishing in the Federal Register, EPA notified 14,000 people (who have asked to be notified on TSCA matters) through the Chemicals-In-Progress Bulletin. The chemical trade press is also notified and generally publishes the information, as well.

When EPA receives Confidential Business Information (CBI) about a chemical from manufacturers and others who must report on the substance because of a section 8(a) rule, the data is provided to the Consumer Product Safety Commission which requested access to this recordkeeping information. The Occupational Safety and Health Administration has been cleared to receive asbestos CBI reported under section 8(a).

Under section 8(e) of TSCA, persons who obtain new information which reasonably supports the conclusion that a substance presents a substantial risk of injury to health or the environment must notify EPA within 15 days. EPA prepares an initial evaluation. This EPA information is forwarded to many Federal agencies who have expressed an interest in receiving section 8(e) non-CBI data. All non-CBI information on the 8(e) notice is put in EPA's public file. The 8(e) notices appear in the TSCA Chemicals-In-Progress Bulletin that goes to more than 14,000 people who asked to be informed on TSCA matters. Some of the chemical trade press also publishes the information.

When EPA decides to identify a chemical subject to TSCA, but which the Agency never evaluated before, it produces a Chemical Hazard Information Profile (CHIP). When a CHIP is prepared, it is made available free to interested agencies and individuals through the Chemicals-In-Progress Bulletin. Again, the chemical trade press often publishes the information.

The TSCA office also receives reports each week on individual chemicals. These voluntary reports come from industry, trade associations and government agencies. After CBI material is removed, the reports are placed in the public file and the chemical trade press reports on the findings.

Through its Office of Air Quality Planning Standards, EPA is providing a clearinghouse for information on toxics in the air, especially to assist State and local governments. The Office of Water Regualtions and Standards is putting together a data base on chemicals in water, using other existing data bases to locate problem areas.

EPA, through its Office of Solid Waste and Emergency Response, is analyzing data on toxic chemcials in landfills and in Superfund sites.

EPA's Office of Research and Development uses the above-mentioned data bases and its own data base to assess chemicals across all media.

The Office of Toxic Substances (OTS) is exchanging the information gathered under its various authorities previously discussed with other EPA offices to provide a more accurate total data base within EPA.

EPA and the Council on Environmental Quality co-chair the Interagency Toxic Substances Data Committee (ITSDC), which has 16 other Federal members, such as Occupational Safety and Health Administration, the Food and Drug Administration, and Consumer Product Safety Commission. The Committee is charged with the responsibility of developing an integrated data network to support Government in toxic research and regulation. Through the ITSDC, all these Federal agencies are kept informed of data that is available through EPA.

EPA, together with National Library of Medicine, has funded the development of a management technology to access vast quantities of chemical information contained in both public and private data bases. This technology is called Chemical Substances Information Network (CSIN), and has been available to the private sector for more than a year. It requires a user to be trained at a cost of $120 (in Washington, DC). The hourly cost is $20. More than 50 companies have been trained and now use this technology to access chemical information.

The system currently allows users to access the following interlocking network of data bases: National Library of Medicine, Chemical Information Service, Chemical Abstract Services, Systems Development Corporation, U.S. Guard Hazard Assessment Computer System, DIALOG - Lockheed Information System, Bibliographic Retrieval Systems, Toxicology Data Management System, and Hazards Information On-Line.

23. Drinking Water (R&D)

A, Question: Why is a major decrease of $1.2M justified by the ending of cooperative projects with the drinking water industry?

Answer: $1M was put into the Drinking Water Technology budget by the Congress in FY 84, as a line item, to fund a two year cooperative research program with American Water Works Association Research Foundation (AWWARF). AWWARF representatives promised to match federal funds and thus double the funds available to solve practical problems of the drinking water industry.

B, Question: What types of projects have been funded in the past?

Answer: Before FY 84, we funded a variety of research projects, some with universities and health agencies, but a majority with public water utilities. This research was designed to define the extent of water quality problems, evaluate control measures and guide utilities to a least-cost solution. Some examples of projects are:

1. An evaluation of full-scale treatment processes for removal of Giardia cysts.
2. A comprehensive investigation of the use of ozone as a preoxidant.
3. A study on the relationship between trihalomethane control practices and the production of other halogenated organic compounds.
4. An investigation of water quality deterioration in the distribution system.
5. An examination of the disposal of water treatment waste products, particularly those considered to be potentially hazardous or toxic -- such as radium, arsenic, and fluoride.
6. Development and evaluation of new technology specifically designed to help small utilities.
7. An evaluation of the current fire-flow criteria in the United States.
8. The development of a protocol for the selection of direct additives (coagulant and filter aids) for water utilities.

C. Question: Are there no opportunities at the present to further such cooperation?

Answer: We intend to continue work jointly with the utilities in the future. This arrangement has and can continue to work successfully.

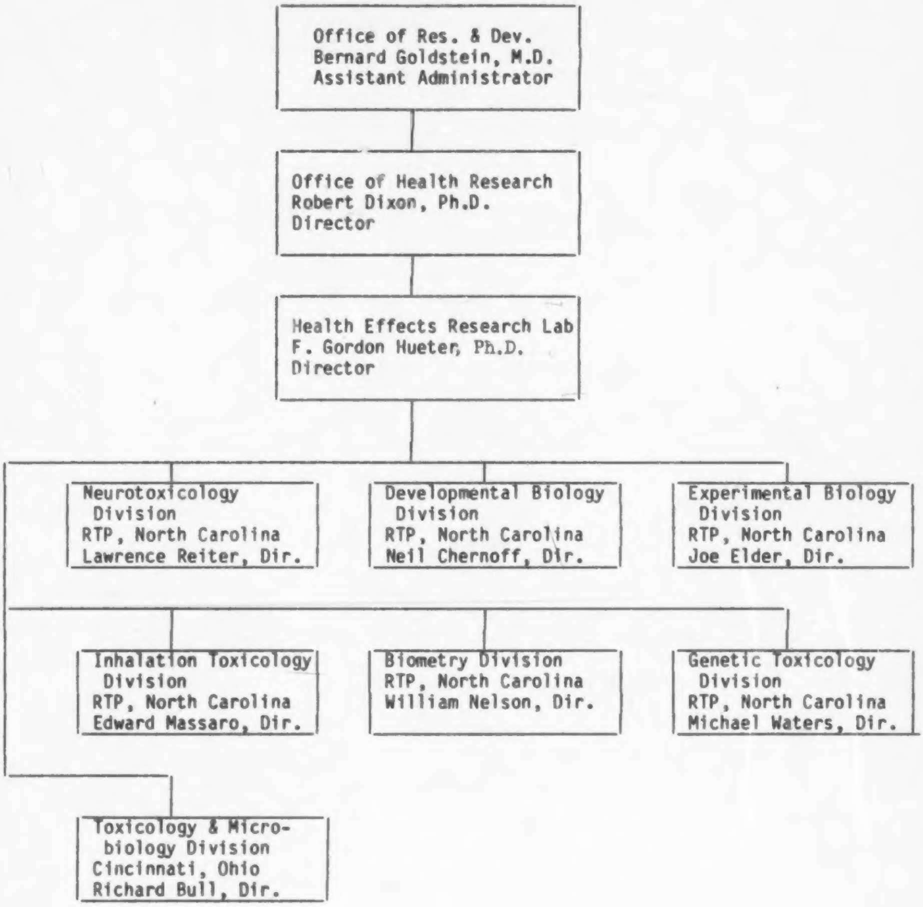
D. Question: What areas of research does the industry fund itself and can it possibly supplement Federal funding?

Answer: Traditionally many large utilities have conducted research to cope with problems or to improve the information used to select a new treatment plant design. The Cooperative Agreement with the AWWARF funded with $1M of FY 1984 funds involves a matching contribution from the industry and will be used to fund high quality high priority research projects in this area.

24. Health Effects Research

Question: Please describe the organization and management for health effects research program at EPA.

Answer: The EPA's health effects research program is run by its Office of Health Research (OHR), in the Office of Research and Development (ORD). The actual research is either done or managed by OHR's Health Effects Research Laboratory (HERL) in North Carolina and Ohio. The HERL is structured and managed along disciplinary rather than programmatic lines. The actual management structure for health research is depicted below.



Office of Res. & Dev.
Bernard Goldstein, M.D.
Assistant Administrator

Office of Health Research
Robert Dixon, Ph.D.
Director

Health Effects Research Lab
F. Gordon Hueter, Ph.D.
Director

Neurotoxicology Division
RTP, North Carolina
Lawrence Reiter, Dir.

Developmental Biology Division
RTP, North Carolina
Neil Chernoff, Dir.

Experimental Biology Division
RTP, North Carolina
Joe Elder, Dir.

Inhalation Toxicology Division
RTP, North Carolina
Edward Massaro, Dir.

Biometry Division
RTP, North Carolina
William Nelson, Dir.

Genetic Toxicology Division
RTP, North Carolina
Michael Waters, Dir.

Toxicology & Microbiology Division
Cincinnati, Ohio
Richard Bull, Dir.

In addition, a smaller amount of health research is supported by ORD's grant program which funds investigator initiated research proposals. This program is run by ORD's Office of Exploratory Research (OER) and not by OHR.

A.1 Question: What fraction of the work is contracted out?

Answer: The extramural part of the OHR budget (The Research and Development appropriation) is about 60% of the total OHR budget. This work includes research contracts, research support contracts, research cooperative agreements, and interagency agreements.

A.2 Question: What is the rationale for contracting out?

Answer: The health effects research program at EPA is guided by the principle that the HERL is primarily a research doing organization and not primarily an organization to support extramural research. Hence the rationale for supporting extramural research is that it's a close support and extension of HERL's in-house research. Thus, examples of major extramural programs on (i) a cooperative agreement with the University of North Carolina and a contract with Rockwell International to help do research in and to help run the HERL's human inhalation chambers, and (ii) contracts with Northrop Services, Inc., and Environmental Health Research and Testing for research personnel and support to extend the in-house research program.

A.3 Question: Describe the peer review process for contracted-out work.

Answer: The extramural work is peer reviewed by selected EPA and non-EPA scientists. Depending on the individual circumstances this review may occur both when a description of the desired work is prepared and in reviewing the proposals in response to that description.

A.4 Question: How does the rigor of the peer review process compare with that at NIH?

Answer: Currently, the two processes can be considered comparable in rigor. The comparison is hard to make, however, as the purpose and hence the processes of the two programs are very different. The EPA's program, as described above, is for direct support and extension of the in-house research program, while the NIH's program is designed for funding investigator initiated research proposals. The NIH's program is much more analogous to EPA's research grant program, and in fact the peer review process for EPA's grant program was modeled on the NIH's procedures.

B. i. Question: What is the current strategy for EPA epidemiological research?

Answer: EPA's current epidemiological strategy is composed of three components:

i. identification of areas of epidemiology to work in
ii. identification of potential new tools to develop and use
iii. implementation of the epidemiological research program

a. Identification of epidemiology areas to work in

Three major areas have been identified for an intense effort.

i. effects of air pollutants, particularly the chronic effects of the criteria pollutants, and concerns from "hazardous" air pollutants.

ii. effects from drinking water, particularly cancers, birth defects and if possible, cardiovascular disease.

iii. effects from occupational exposure, first for the usefulness of the data itself for risk assessment and seond as part of the validation process for short-term tests biological marker techniques.

b. Identification of new tools

The new tool research will emphasize two areas:

i. better methods for determining actual human exposures to noxae.

ii. development of human biological markers for more accurate estimation of individual exposure and for use as a reliable predictor of chronic disease.

c. Implementation

Implementation will proceed along four paths.

i. ORD will establish an epidemiology group to do and support epidemiology.

ii. ORD will continue to enthusiastically support an Epidemiology Research Center at an appropriate university.

iii. The above mentioned researcher initiated grant program will continue to support epidemiological research proposals.

iv. ORD will coordinate its epidemiology with other Federal support for epidemiology by:

- direct support to do epidemiology of interest to EPA,
- piggy-backing on other studies where an EPA contribution can result in data to EPA that would not otherwise be made available. An area to be stressed here is EPA's expertise and experience in exposure measurement.

B.2. Question: How does this strategy fit into the total Federal area in this field?

As mentioned above, ORD will piggy-back on other Agency studies where an EPA contribution can result in data to EPA that would not otherwise be made available. An area to be stressed here is EPA's expertise and experience in exposure measurement.

25. INDOOR AIR POLLUTION

Question - The FY 1985 R&D authorization bill (H.R. 2899) addressed the need for a research program on indoor air quality and authorized $4 million for the program in both FY 1984 and FY 1985. However, the Administration's FY 1985 budget requested no funds for indoor air pollution studies.

Question - A: Did EPA request funding from OMB for indoor air pollution for FY 1985? If so, did OMB eliminate indoor air research funding from the OMB request?

Answer: EPA requested funding for indoor air research in its FY 1985 budget proposal; but the passback from OMB deleted the EPA research request for indoor air in FY 1985.

Question - B: What is OMB's position on indoor air pollution research?

Answer: OMB's position is that since no regulatory responsibility exists to deal with indoor air pollution, the Agency's research into this area is not consistent with any regulatory mandate. Hence, EPA research on indoor air pollution is not a high priority item in the view of OMB.

Question - C: What is EPA's policy regarding research on indoor air pollution?

Answer: EPA believes that research on indoor air pollution is important. Understanding indoor air pollution exposures is necessary as the Agency begins to deal with the total body burden and health impact of environmental pollutants across media. In the context of a limited Federal budget, however, the need to pursue indoor air pollutant must be balanced against other pressing demands.

26. GREAT LAKES

Question: The Science Advisory Board of the International Joint Commission has reported that the atmosphere is now the major source of toxic contamination of the Great Lakes. What research is EPA doing that will support development of management policies and programs on atmospheric deposition?

Answer: In support of the development of management policies and programs on atmospheric deposition, the EPA will initiate a research program in 1985 to develop methods to assess and evaluate organic contamination of the Great Lakes via atmospheric deposition. In FY 1985, the resources devoted to this program will be $100,000.

27. Great Lakes (U.S. Canada Accords)

QUESTION: How is EPA fulfilling the United States' obligation for research under the Great Lakes Agreement with Canada?

RESPONSE: The Agency is funding research--8 workyears and $2.5 million--in fiscal year 1984 that is specifically designated for the Great Lakes. Work will be concentrated on identification and evaluation of Great Lakes sources of pollution. Mathematical models and other predictive techniques are being developed which can be applied to understanding the transport and fate of toxic pollutants. However, most of the pollution problems in the Great Lakes are comparable to nationwide problems. They can be and are researched as part of the U.S. national water quality and toxic substances research programs. In fiscal year 1984, approximately $6 million in water quality research work is being conducted that is applicable to problems in the Great Lakes.